



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

DEC 20 2012

Mr. Larry Williams
Field Office Supervisor
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
NOAA Fisheries Service
Southeast Regional Office
263 13th Avenue South
Saint Petersburg, Florida 33701

SUBJECT: Transmittal of Biological Evaluation for the EPA's approval of new and revised water quality standards in Chapters 62-302 and 62-303, Florida Administrative Code.

Dear Mr. Williams and Mr. Bernhart:

The United States Environmental Protection Agency, Region 4 (EPA) would like to request the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration Fisheries Service (Services) review of the enclosed biological evaluation (BE) for the referenced water quality standard provisions. The EPA is submitting this request under the informal consultation provision of 50 CFR § 402.13 and has made determinations of "Not Likely to Adversely Affect" or "No Effect" for all aquatic and aquatic dependent species and their critical habitats within the specific waters further detailed within the enclosed BE. However, EPA is only requesting concurrence on those determinations of "Not Likely to Adversely Affect."

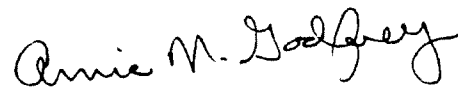
On November 30, 2012, the EPA approved the provisions of Chapter 62-302 and Chapter 62-303 that the EPA determined to be new or revised water quality standards for the State of Florida. The EPA has determined that these new and revised water quality standards are consistent with 40 CFR Part 131 and the Clean Water Act (CWA). The enclosed BE only includes determinations of "Not Likely to Adversely Affect" or "No Effect" for the specific provisions that EPA has determined to be new and revised standards for the State that are subject to this consultation.

Under the Memorandum of Agreement signed by the Services and the EPA regarding enhanced coordination under the CWA and Endangered Species Act, provision V.B.6. requests the EPA notify the Services in writing when they make "not likely to adversely affect" determinations.

Additionally, the Services will respond in writing within 30 days of receipt of such a determination, unless extended by mutual agreement. The response will state whether the Service concurs or does not concur. If the Service does not concur, it will provide a written explanation that includes the species and/or habitat of concern, the perceived adverse effects, supporting information, and a basic rationale.

Please contact Lauren Petter at (404) 562-9272 or petter.lauren@epa.gov for issues dealing with the enclosed BE.

Sincerely,

A handwritten signature in cursive script that reads "Annie M. Godfrey".

Annie Godfrey
Chief
Water Quality Standards Section

Enclosure: Biological Evaluation with attachments

cc: Anthony Sowers

**Biological Evaluation for the EPA Clean Water Act Section 303(c) Approval of
Chapter 62-302. F.A.C. Surface Water Quality Standards and 62-303. F.A.C
Identification of Impaired Surface Waters**

This documents the EPA's determination that the EPA's decision to approve new and revised water quality standards in Rule 62-302 of the Florida Administrative Code (F.A.C.) [Surface Water Quality Standards] and Rule 62-303. F.A.C. [Identification of Impaired Surface Waters] (referred to collectively as Rule in this memorandum), subject to completion of Endangered Species Act (ESA) consultation with the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries Service (the Services), is consistent with section 7(d) of the ESA.

The EPA initiated consultation with the Services on October 3, 2012. Section 7(a)(2) requires that federal agencies, in consultation with the Services, ensure that their actions are not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. Upon initiation of consultation, section 7(d) of the ESA prohibits irreversible or irretrievable commitments of resources that have the effect of foreclosing the formulation or implementation of reasonable and prudent alternatives which would not violate section 7(a)(2) of the ESA.

The EPA's approval decision does not foreclose either the formulation by the Services, or the implementation by the EPA, of any alternatives that might be determined in the consultation to be needed to comply with section 7(a)(2). By approving the standards "subject to the results of consultation under section 7(a)(2) of the Endangered Species Act," the EPA has explicitly stated that it retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial action by the EPA. The EPA retains the full range of options available under section 303(c) for ensuring water quality standards are environmentally protective. The EPA can, for example, work with the State to ensure that the State revises its standards as needed to ensure listed species' protection, initiate rulemaking under section 303(c)(4)(B) of the CWA to promulgate federal standards to supersede the State standards or, in appropriate circumstances, change the EPA's approval to a disapproval.

The EPA believes that it is unlikely that the Services will conclude that the State's standards violate section 7(a)(2), since the new and revised standards provisions in the Rule include, among other provisions, additions and revisions to the State's definitions and the addition of numeric criteria for springs, lakes, streams, and some estuaries, as well as a procedure for developing site-specific alternative criteria. The changes made by FDEP reflect an overall effort to interpret the existing narrative nutrient criterion and reflect a hierarchy for criteria development based on site-specific analysis, stressor-response relationships, or reference distributions. The EPA reviewed every provision adopted by the State, and for those provisions determined to be new or revised water quality standards, the EPA's conclusion regarding the respective provision's consistency with the section 303(c) of the Clean Water Act is indicated in further detail in Attachment A, which contains the November 30, 2012 transmittal letter from EPA to FDEP and associated decision document. A summary of which provisions are or are not new and revised water quality standards is provided in Attachment B and Attachment C.

Summary of FDEP Rule

FDEP has developed a hierarchical approach to the development of the numeric nutrient Rule. This approach sets out the method by which FDEP will interpret their narrative nutrient criterion which states that “in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.” The Rule’s hierarchical approach gives preference to site-specific analyses that result in numeric interpretations of the narrative criteria.

A hierarchy 1 criterion, the preferred numeric criterion, is obtained with a site-specific analysis such as a total maximum daily load (TMDL), site-specific alternative criterion (SSAC), water quality based effluent limitation (WQBEL), or other FDEP approved action that numerically interprets the narrative criterion. If these site-specific analyses have already been developed or as they become developed in the future, they are considered the numeric interpretation of the narrative criteria under hierarchy 1 and are the applicable criteria for the specific waterbody. If a hierarchy 1 interpretation is not available, the Rule’s hierarchical approach then gives preference to numeric nutrient values based on quantifiable stressor-response relationships between nutrients and biological response (*i.e.*, springs and lakes) under hierarchy 2. If no quantifiable stressor-response relationship has been established, such as is the case for Florida streams, reference-based nutrient thresholds, in conjunction with biological information, are used to determine the applicable interpretation of the narrative criteria under hierarchy 3. For those waters without a numeric interpretation under any of these approaches, the narrative criteria continue to apply to the waterbody.

Springs Criterion

For springs, FDEP will apply a criterion of 0.35 mg/L of nitrate-nitrite as an annual geometric mean, not to be exceeded more than once in a three consecutive calendar year period for spring vents. The spring vent nitrate-nitrite criterion is based on a hierarchy 2, stressor-response relationship between nitrate-nitrite and the presence of nuisance algal mats, with the criterion established at a concentration that would prevent nuisance algal mats from occurring. FDEP will assess spring vents against this criterion as part of the five year basin rotation cycle for monitoring and assessing waters. If a spring vent meets the criterion, it is assessed as attaining water quality standards (WQS). If it exceeds the criterion, the spring vent is assessed as impaired and placed on the CWA 303(d) list as requiring a TMDL.

Lake Criteria

FDEP has classified lakes into three categories: colored lakes, clear lakes with high alkalinity and clear lakes with low alkalinity. The lakes criteria were based on a hierarchy 2, stressor-response relationship between total nitrogen and total phosphorus (TN and TP) and phytoplankton response (chlorophyll *a*). The lake chlorophyll *a* criteria were derived using multiple lines of evidence yielding chlorophyll *a* criteria for each of the lake categories. From the chlorophyll *a* criteria, acceptable ranges were determined for TN and TP. All three of these criteria are applied as annual geometric means, not to be exceeded more than once in a three consecutive calendar year period. FDEP will assess lakes against these criteria through their five year basin rotation cycle for monitoring and assessing waters. If a lake’s chlorophyll *a*, TN or TP levels are at or below the corresponding criterion, the lake will be assessed as meeting the criteria. Under certain circumstances TN and TP criteria can differ on an annual basis, depending on the current levels of TN and TP, as long as those levels fall within the acceptable ranges and the chlorophyll *a* is below the appropriate threshold. If any of the parameters do not meet the criteria or are outside of the acceptable ranges, the lake is assessed as impaired and placed on the CWA 303(d) list as requiring a TMDL.

Stream Criteria

For stream criteria, FDEP has developed reference-based nutrient thresholds, in conjunction with biological information, to determine the applicable interpretation of the narrative criteria under hierarchy 3. Despite an exhaustive effort to develop stressor-response relationships between nutrients and biological responses in streams, insufficient responses were observed to develop numeric nutrient criteria. Therefore, to assess whether a stream attains the narrative criteria, an evaluation of water chemistry and biological data (flora and fauna), is used to determine if a stream's nutrient concentrations are protective of balanced flora and fauna.

FDEP's approach to protective stream criteria is based upon the belief that nutrients (TN and TP) in streams are only a problem when in excess, and then only if the excess nutrients stimulate excess plant or algal growth which then has the potential to adversely affect aquatic animals. The amount of excess plant or algal growth impacts aquatic animals by smothering their habitat, disturbing the food webs, or when decomposed, by depleting the available oxygen in the water. These changes in an aquatic system can be expected to show up in biological indicators, such as excessive algal mats, excess water column chlorophyll, excess nuisance vascular plant growth, and/or failing health scores for faunal communities. Adverse changes in these biological endpoints beyond a certain level can be considered evidence of an imbalance of aquatic flora and/or fauna.

FDEP follows this approach in the design of the stream criteria by making floral and faunal health considerations critical components of the Rule. Floral imbalance is determined by floral metrics derived by FDEP based on data and scientific information that indicate support for the State's recreation and aquatic life use: "recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife." FDEP has derived floral metrics for chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition. FDEP states that if any one of the floral measures indicates an imbalance, then the stream does not attain the numeric nutrient criteria. These metrics are included in the technical support documents submitted as part of the Rule package and specifically referenced in the Rule itself. Faunal imbalance is measured by the stream condition index or SCI. The SCI is a biological assessment procedure that measures the degree to which flowing fresh waters support a healthy, well-balanced biological community, as indicated by benthic macroinvertebrates. Attainment of the SCI threshold is an indication that the faunal community of the stream is not being adversely affected by nutrients to the extent that there is a loss in designated use. However, failure of the SCI alone does not necessarily mean that the stressor causing the loss of designated use is nutrients.

For streams, not addressed under a site-specific interpretation under hierarchy 1, FDEP uses a two-part method to interpret the narrative nutrient criterion. For the first part of the two-part method FDEP determines if the floral components are each independent indications of imbalanced flora. If they are not, then FDEP concludes there is no imbalance of flora in the waterbody. If any one of these floral measures indicates an imbalance, then the whole of the stream segment is imbalanced. For the second part of the two-part method, FDEP evaluates faunal responses (demonstrated by SCI) and water chemistry (TN and TP concentrations). If the stream exhibits either an average SCI score of 40 or greater (indicating balanced fauna) or concentrations of TP and TN equal to or less than the established thresholds, FDEP concludes that the waterbody is meeting its designated use.

Due to the complexity of the stream criteria, FDEP submitted an accompanying implementation document. This document explains how FDEP intends to implement the stream criteria and determine

imbalance of flora and fauna. It includes examples and scenarios of how FDEP would assess compliance with the stream criteria and when a stream would be listed on Florida's verified list, study list, or planning list. Note that waters on both the verified and study list are included in the CWA 303(d) list as waters requiring TMDLs.

Estuary Criteria

Estuary-specific numeric interpretations of the narrative criteria were derived for estuaries along the South and Southwest Coast. This includes: Tampa Bay, Clearwater Harbor, Sarasota Bay, Charlotte Harbor, Clam Bay and South Florida marine waters. FDEP adopted these criteria to protect recreation and a healthy, well-balanced population of fish and wildlife, and included them as hierarchy 1 interpretations. For Tampa Bay, Clearwater Harbor, Sarasota Bay and Charlotte Harbor derivation of numeric criteria was based upon the research, data, and work of the National Estuary Programs or NEPs. The criteria for these estuaries were derived through a collaborative effort to improve and restore sea grass. All southwest estuary criteria, except for Tampa Bay which are expressed as delivery ratios, are expressed as concentrations not be exceeded more than once in three consecutive years.

FDEP developed criteria for the marine waters of southernmost Florida by grouping those waters geographically into four large south Florida systems (Tidal Coghatchee River/Ten Thousand Islands, Florida Bay, the Florida Keys, and Biscayne Bay) and then using a maintain healthy conditions approach. Important biological communities, water quality conditions, and nutrient sources were evaluated in each system to establish the status and determine if a system, or part of a system, is meeting the designated use. Using statistics with a prediction interval, FDEP calculated criteria that reflect healthy conditions in the waterbody while shielding against a statistically false positive result (that is, identification of a healthy waterbody as impaired).

FDEP also included a schedule for the development of criteria for the remaining estuaries in the State. A Rule with numeric nutrient criteria for Perdido Bay, Pensacola Bay (including Escambia Bay), St. Andrews Bay, Choctawhatchee Bay, and Apalachicola Bay will be completed by June 30, 2013. FDEP adopted numeric nutrient criteria for these estuaries on November 13, 2012 and will be submitting these for EPA review. A Rule for numeric nutrient criteria for the remaining estuaries will be completed by June 30, 2015.

Downstream Protection

Protection of downstream waters is required in FDEP's nutrient Rule by the statement, "The loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters." FDEP will implement this narrative by: using models to allocate to upstream watersheds when establishing the TMDL for the downstream waterbody; requiring dischargers, at the time of permit issuance, to provide reasonable assurance that their effluent does not cause or contribute to nutrient impairments in the receiving waterbody and downstream waterbodies; and identifying increasing trends in nutrient concentrations in all waters, including downstream waters, during the assessment cycle. For permitting, if a downstream water is currently attaining its nutrient standards, then current conditions in the upstream waters provide for the attainment condition and therefore loading of nutrients from the waterbody would be limited to current conditions. However, a comprehensive water quality based effluent limit would be required to evaluate the impacts on downstream waters if the facility requests an increase in their permitted load. If a downstream

waterbody is not attaining nutrient standards, the permit could not be issued until reasonable assurance was provided that the facility's discharge was not contributing to the impairment. In this case modeling can be used to ensure that loading of nutrients from the upstream waterbody is limited as necessary to provide for the attainment and maintenance of the water quality standards of downstream waters.

The FDEP Rule includes an evaluation of trends to ensure that conditions are not increasing in a manner that could result in impairment downstream. If there is an increasing trend of chlorophyll *a* and the waterbody is expected to become impaired within 5 years, then it is placed on Florida's verified list and CWA 303(d) list for nutrient impairment. FDEP will expedite the development of a TMDL to address and prevent the potential impairment. If there is an increasing trend of chlorophyll *a*, nitrate-nitrite, TN or TP and the waterbody is expected to become impaired within 10 years, then it is placed on Florida's study list and CWA 303(d) list. Applicable studies would be conducted within the current or next listing cycle to determine if the waterbody requires a TMDL. If there is a statistically significant adverse trend in chlorophyll *a*, TN or TP without a projected impairment within 10 years, the waterbody will initially be placed on Florida's planning list so that a more rigorous statistical analysis can be conducted. A determination of impairment status will be made for these waterbodies in the next listing cycle.

Site-Specific Alternative Criteria

FDEP's Rule provides a predictable approach to developing nutrient SSACs. The Rule language provides clear expectations on the water quality and biological data needed to characterize existing nutrient concentrations and aquatic health. Future applications of this process that result in alternative criteria will be subject to EPA review and subsequent ESA consultation.

Impaired Waters Rule

FDEP also made changes to their impaired waters Rule (IWR) which include the trend analysis and provide processes to determine if waterbodies (or waterbody segments) should be placed on the verified list and CWA 303(d) list of impaired waterbodies for subsequent TMDL development. The listings are made in accordance with evaluation thresholds, data sufficiency and data quality requirements in the IWR. The results of the assessment are used to identify waters in each basin for which TMDLs will be developed. The IWR also includes the provision for the new "study list," which is also a part of the CWA 303(d) list.

Discussion of Rule Provisions

For each of the following provisions, EPA considered the species lists included in Attachments D and E, which detail those species under the jurisdiction of the Services. The determination with regard to ESA consultation for each provision is given below the summary of that section or provision.

- 1) Changes within 62-302.200 included editorial, non-substantive changes to Florida's EPA-approved water quality standards and substantive changes to the definitions of biological health assessment, lake, lake vegetation index, natural background, nutrient, nutrient response variable, nutrient threshold, nutrient watershed region, predominantly fresh waters, predominantly marine waters, spring vent, stream, and stream condition index.

Conclusion: For the substantive changes to the definitions section, EPA concluded these revisions have no effect on the listed species or their critical habitat.

- 2) Rule 62-302.530 consists of a table of the water quality criteria that apply to Florida's surface waters. The introductory paragraph to the table was revised to include the following sentence:

Numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530 (47)(b), F.A.C., shall be expressed as spatial averages and applied over a spatial area consistent with their derivation.

This provision clarifies that FDEP will apply the numeric nutrient criteria over an area consistent with derivation of those criteria.

Conclusion: This added sentence defines how the narrative nutrient criteria will be expressed, which is compatible with the procedures used to establish the criteria and does not change the criteria itself. Therefore, there will be no effect on the listed species or their critical habitat.

- 3) Rule 62-302.531(2)(a) numerically interprets the State's narrative nutrient criterion, which provides that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Rule is organized in a hierarchical manner, representing FDEP preferred approaches to establishing numeric interpretations for its narrative criterion.

Conclusion: This provision simply lays out the procedural considerations by the State. The hierarchy itself has no effect on listed species or their critical habitat.

- 4) The provisions for numeric nutrient criteria for lakes at subparagraph 62-302.531(2)(b)1 below provide that the numeric interpretations for TN and TP for a lake will vary on an annual basis and establish the allowable frequency of exceedance of the water quality criteria for chlorophyll *a*, TN and TP for lakes as no more than once in any consecutive three-year period.

Conclusion: The criteria based on chlorophyll *a* are established at levels that support healthy ecosystems and threatened and endangered species. Implementation of these criteria through state water quality programs should result in reduced nutrient loads to the waterbody, and therefore, have a positive effect on other water quality parameters that are indicative of a healthy aquatic system. Therefore, deriving a chlorophyll *a* criterion based on use protection, as well as deriving TN and TP criteria from the demonstrated relationship with chlorophyll *a*, are expected to reduce eutrophication and algal growth that are associated with the degradation of water quality and aquatic life. The implementation of these criteria will have the potential to improve the water quality in lakes by reducing eutrophication and nuisance algal growth, the effect of which is wholly beneficial and, therefore, not likely to adversely affect listed species or their critical habitat.

- 5) The magnitude, frequency and duration of the water quality criterion for nitrate-nitrite ($\text{NO}_3 + \text{NO}_2$) adopted by the State for freshwater spring vents in subparagraph 62-302.531(2)(b)2 are based on interpretation of Florida's nutrient narrative provision at 62-302.530(47)(b) for springs designated as Class I and Class III freshwaters.

Conclusion: The springs methodology prohibits an imbalance of flora and fauna. Therefore, deriving the springs criterion based on protection of flora and fauna should have a wholly beneficial effect, reduce nuisance algae and periphyton in springs and contribute to the overall health of the systems into which springs feed. Therefore, this provision is not likely to adversely affect listed species or their critical habitat.

- 6) For streams, paragraph 62-302.531(2)(c) applies where neither a primary hierarchy level site-specific numeric interpretation nor a second hierarchy level quantifiable cause-and-effect relationship has been established for a particular waterbody. The State has elected to use a criterion comprised of a two-part method to interpret its narrative nutrient criterion for such streams. The criterion includes a combination of biological information and numeric thresholds for TN and TP. The State will consider whether aquatic flora have been adversely affected by nutrients (or some other stressor) based on a list of floral response indicators, together with either a fauna biological health assessment, in this case SCI, or the nutrient threshold concentrations set out in subparagraph 62-302.531(2)(c)2.

In addition, the following excerpts are from the SCI Primer, a document incorporated by reference into the State rule that relates to the floral metrics for streams. The bold text represents the portions of the text that EPA reviewed as new or revised water quality standards. The conclusion below applies to both the provision located at 62-302.531(2)(c) and the bolded text of the excerpts below.

Nuisance macrophyte growth

From SCI Primer Section 2.7.4 (page 23)

[If a stream exhibits a C of C score of >2.5 and a frequency of occurrence of FLEPCC exotics is <25% of the total plant occurrences, this would be considered an indication of no imbalance of flora.]

Presence of algal mats

From SCI Primer Section 2.7.3 (page 22)

[If a stream exhibits RPS rank 4-6 percent coverage between the mean percent observed at these minimally disturbed and healthy sites (6-8%) and the associated 90th percentile values (25-32%), this would be considered an indication of no imbalance of flora.]

Changes in algal species composition

From SCI Primer Section 2.7.3 (page 22)

[If the percentage of sampled points with a thickness rank of 4-6 is 20% or greater, the biologist collects a composite sample of the dominant groups of periphyton in the stream segment for lab identification of the dominant algal taxa. If autecological information is available for the dominant taxa, this is also qualitatively evaluated.]

Algal blooms and Chlorophyll a levels

From SCI Primer Section 2.7.5 (page 24)

An unacceptable phytoplankton bloom would consist of a situation where an algal species,

whose noxious characteristics or presence in sufficient number, biomass, or areal extent may reasonably be expected to prevent, or unreasonably interfere with, the designated use of the waterbody.

*DEP evaluates the autecological information for the dominant bloom species, in conjunction with the associated chlorophyll *a* and the persistence of the bloom, as a line of evidence when assessing imbalances of flora.*

If a stream exhibits annual geometric mean chlorophyll concentrations between the mean observed at these minimally disturbed and healthy sites (2.0-2.1µg/L) and the associated 90th percentile values (3.2-3.5µg/L), this would be considered a clear indication of no imbalance of flora.

Conclusion: This process ensures that nutrient concentrations provide for a well balanced natural population of flora and fauna. Implementation of these numeric nutrient criteria will reduce eutrophication and are wholly beneficial. Therefore, this provision is not likely to adversely affect listed species or their critical habitat.

- 7) Subsection 62-302.531(3) identifies the analytical methodology to be used for measurement of chlorophyll *a* concentrations assessed under Florida's nutrient rule and includes a reference to that methodology.

Specifically, the last sentence in Subsection 62-302.531(3), as a new or revised water quality standard, because it specifies that chlorophyll *a* measurements made after the effective date of these WQS revisions must be corrected for, or free from, the interference of phaeophytin.

Phaeophytin is a degradation product of algal cell chlorophyll, and is not an appropriate measure of algal biomass or primary productivity. This sentence ensures that measurements of chlorophyll *a* are accurate and most appropriately assess chlorophyll *a* levels.

Conclusion: The criteria based on chlorophyll *a* are established at levels that support healthy ecosystems and threatened and endangered species. Implementation of these criteria through state water quality programs should result in reduced nutrient loads to the waterbody and have a positive effect on other water quality parameters that are indicative of a healthy aquatic system. Therefore, deriving a chlorophyll *a* criterion based on use protection, as well as deriving TN and TP criteria from the demonstrated relationship with chlorophyll *a*, is expected to reduce eutrophication and algal growth that are associated with the degradation of water quality and aquatic life. Therefore, this provision is not likely to adversely affect listed species or their critical habitat.

- 8) Subsection 62-302.531(4) provides that "[t]he loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters." In addition to subsection 62-302.531(4), the State, in adopting revisions to Chapters 62-302 and 62-303, further addressed the protection of downstream waters/downstream WQS in several new provisions of Florida WQS, including new/revised provisions at 62-302.800(3), 62-302.800(3)(a)3., 62-303.390(2)(a), and 62-303.450(4). In addition to these provisions of Florida WQS, the provisions of 62-303.390(3) also reinforce how these downstream protection provisions will be incorporated

into nutrient criteria for certain waters included on Florida's CWA section 303(d) list. Each of these provisions serves as a fundamental component of the State's approach for protection of downstream water quality.

Conclusion: The new and revised downstream WQS provisions adopted by the State provide numeric processes that will ensure the attainment and maintenance of downstream waters by requiring nutrient control measures and where nutrient impairment has already been documented and where nutrient standards are currently met in downstream waters but maintaining compliance with those nutrient standards is threatened (documented by water quality trends). In addition, the State has included downstream protections in provisions related to establishing nutrient SSAC and water body assessment. The combination of these provisions will allow the State to address existing impairments due to nutrients and it provides a proactive component to address projections of impairments. Implementation of these provisions will reduce eutrophication and are wholly beneficial. Therefore, this provision is not likely to adversely affect listed species or their critical habitat.

- 9) Subsection 62-302.531(7) describes how four types of numeric interpretations will be applied spatially. The provision applies to site-specific criteria associated with 62-302.531(2)(a), lakes, spring vents, and streams. When applying the criteria established for lakes, spring vents and streams in paragraphs 62-302.531(2)(b) and (c), the State's intention is that the criteria apply at a representative location for the given waterbody type. In each case, the State's criteria derivation is consistent with how the spatial application is detailed in this particular provision.

Conclusion: Since states are required to adopt criteria that protect their designated uses, describing the spatial extent consistent with the criteria derivation that protects the uses ensures that the spatial application of the criteria is also protective. Since the specific criteria were determined to not likely adversely affect listed species or their critical habitat, this provision was determined to also not likely adversely affect listed species or their critical habitat.

- 10) Subsection 62-302.532(1) includes an extensive table of criteria values for those estuarine and coastal waters described above in the summary.

Conclusion: The numeric nutrient criteria adopted by the State will serve to protect the uses designated by the State for the estuarine and marine waters. Implementation of these criteria will reduce eutrophication and are wholly beneficial. Therefore, this provision is not likely to adversely affect listed species or their critical habitat.

- 11) Subsection 62-302.532(2) defines the geospatial extent of the estuary areas identified by name. The rule incorporates by reference maps of each of the named estuary areas with specific spatial delineation of the included subsegments corresponding to entries in the criteria table. Directions to a website link and a contact mailing address are provided.

Conclusion: This provision identifies the specific spatial coverage where the criteria are to be applicable to provide protection for the estuarine waters. This provision in conjunction with the criteria values provides protection of healthy, well-balanced biological communities in the subject estuaries and provides that the numeric nutrient criteria will be applied over an area consistent with derivation of those

criteria. Describing the spatial extent consistent with the criteria derivation that protects the uses ensures that the spatial application of the criteria is also protective.

- 12) The revisions to 62-302.800(2)(d) add citations from 62-302.530, *Table: Surface Water Quality Criteria*, and the definition of “nuisance species,” for the parameters which are not candidates for Site-Specific Alternative Criteria (SSAC) under the provisions of Rule 62-302.800.

These citations were included to lower the degree of inherent complexity of the regulation and to facilitate a better understanding of the provisions referenced in this paragraph.

Subsection 62-302.800(3) establishes the demonstration requirements and the administrative process to establish a Type III SSAC. The demonstration requirements for adoption of Type III SSAC are established in paragraphs (a) and (b) of this subsection. Prior to State adoption of a Type III SSAC, two demonstrations are required: (1) the SSAC must achieve the narrative nutrient criteria in paragraph 62-302.530(47)(b), and (2) the SSAC must be protective of downstream waters. Type III SSAC are adopted by Secretarial Order, and the administrative process for adoption of a Type III SSAC must include a public notice of a proposed SSAC and provide for an opportunity for a public hearing on the proposed revision to WQS.

Conclusion: In regard to 62-302.800(2)(d) and (3), these provisions lay out the procedural considerations to be used by the State when adopting alternative criteria for nutrients. Each adoption of a SSAC for nutrients will be reviewed by the EPA to ensure that all of the requirements for State revision of WQS have been met. These provisions have no effect on listed species or their critical habitat.

- 13) A revision to 62-302.800(6) was needed to reflect that this provision now only applies to Type II SSAC, and does not address Type I SSAC or Type III SSAC. The provision was also revised to acknowledge that certain SSAC apply during defined months or seasons during each year, and additional language was also adopted to clarify that the “statewide” criteria in rule 62-302.530 apply during any part of the year that SSAC do not address.

Conclusion: Since states are required to adopt criteria that protect their designated uses, describing the seasonal application consistent with the criteria derivation that protects the uses ensures that the application of the criteria is also protective. Since the specific criteria were determined to not likely adversely affect listed species or their critical habitat, this provision was determined to also not likely adversely affect listed species or their critical habitat.

- 14) EPA determined that the revisions to 62-303.200(2), (8), the deleted portion of (9), (28), and the deleted definition of “trophic state index,” were new or revised definitions in 62-303.

Conclusion: The definitions of biorecon, lake, the deletion of the lake condition index, stream, and deletion of trophic state index have no effect on the listed species or their critical habitat.

- 15) For the remaining changes to 62-303, and discussed further in EPA’s decision document, EPA has concluded that several portions of Rule 62-303 are new or revised water quality standards, but also has concluded that many portions of the amended IWR are not new or revised water quality standards. Specifically, those provisions of the IWR relating to magnitude, duration and frequency of load or concentration exceedances that define or revise the “ambient condition” or “level of

protection” that the State affords waters for purposes of making attainment decisions constitute new or revised water quality standards. An attainment decision is one where a State decides what it means to attain or to not attain any “water quality standard applicable to such waters” for purposes of establishing total maximum daily loads (TMDLs) under section 303(d)(1)(A) of the Act, 33 U.S.C. § 1313(d)(1)(A). TMDLs, in turn, serve as the basis for NPDES permit limitations. Provisions that affect attainment decisions made by the State and that define, change, or establish the level of protection to be applied in those attainment decisions have the effect of revising existing standards under section 303(c) of the Act. These provisions constitute new or revised water quality standards subject to EPA review pursuant to the Act. Conversely, provisions that merely describe the sufficiency or reliability of information necessary for the State to make an attainment decision, and do not change a level of protection, are not WQS but are rather methodologies under section 303(d) of the Act. See 40 C.F.R. § 130.7(b)(6). While these provisions are not reviewed by EPA as new or revised water quality standards, they are considered by EPA in reviewing lists of impaired waters submitted by the State pursuant to section 303(d) of the CWA.

Florida’s assessment methodology establishes three categories for waters that have been identified as impaired, or potentially impaired, waters: the planning list, study list, and verified list. Both the study and verified lists will be submitted to EPA as Florida’s CWA section 303(d) list of impaired waters. Pursuant to State law, however, FDEP may only develop and establish TMDLs for those waterbodies on the verified list.

Florida has described the bases for placing a waterbody on the planning list in sections 62-303.310, 62-303.330, and 62-303.350 through 62-303.354 of the IWR. Florida has described the bases for placing a waterbody on the study list in section 62-303.390. Florida has described the bases for placing a waterbody on the verified list in provisions 62-303.430 and 62-303.450. The State’s verified list process also includes provision 62-303.420, which is described in a later section. Finally, Florida has identified the bases for removing a water body from the verified list in section 62-303.720.

EPA determined that provisions of the amended IWR that affect only the State’s decision to include a waterbody on the planning list do not constitute new or revised water quality standards, because placing a water on the planning list does not affect an attainment decision. To the extent that a planning list provision also affects the State’s decision to identify a waterbody on the study or verified lists, however, that provision does affect an attainment decision. EPA considered such provisions further to determine whether the provision also defined, changed, or established the level of protection to be applied in those attainment decisions.

Conclusion: By including several provisions that relate directly or indirectly to the use of data for endangered and threatened species, Florida has afforded itself ample opportunity to list waters based on conditions that could impact threatened and endangered species, and none of these provisions would limit or restrict this level of protection. New information may regularly be considered and future assessment and listing is not foreclosed in any way. As such, this approval does not foreclose the formulation or implementation of any reasonable and prudent alternative measure. No future action – *e.g.*, modification of a water quality standard or additional listing of impaired water – is in any way precluded by this approval action, which puts in place additional methodologies and tools for the State to identify impaired waters and, therefore, more efficiently and effectively improve the quality of those waters.

Placement of a water body with threatened and endangered (T&E) species or critical habitat on the State's 303(d) list would result in the development of either a State approved management plan or a TMDL approved or established by EPA. Either of these two activities would have the desired intent to return the water quality to a fully supporting condition that is beneficial to the T&E species and or their critical habitat. Therefore, these provisions are not likely to adversely affect listed species or their critical habitat.

ESA Summary

FDEP's new and revised water quality standards within 62-302 include, among other provisions, additions and revisions to the State's definitions and the addition of numeric criteria for springs, lakes, streams, and certain estuaries, as well as a procedure for developing alternative criteria. The changes made by FDEP reflect an overall effort to interpret the existing nutrient narrative criterion and reflect a hierarchy for criteria development by site-specific analysis, stressor-response relationships, or reference distribution. For the substantive changes to the definitions section of this Rule, EPA concluded these revisions have no effect on the listed species or their critical habitat.

The EPA has determined that its approval of the addition of numeric criteria for springs, lakes, streams, and estuaries, which are primarily outlined within Rule 62-302, as well as the procedure for developing alternative criteria will not likely adversely affect or will beneficially affect listed species, critical habitat and food sources.

Provisions within Rule 62-303 only affect the assessment of waters for purposes of identifying water quality limited segments that subsequently are the subject of Total Maximum Daily Load (TMDL) development under section 303(d) of the Clean Water Act. None of these provisions affects discharges permitted under the National Pollutant Discharge Elimination System program, nor would any of these provisions affect the water quality target for a TMDL. The specific provisions that are new and revised water quality standards enable Florida to effectively identify waters where TMDL development and implementation are necessary through use of quantitative thresholds and narrative provisions. Placement of a waterbody with T&E species or critical habitat on the State's 303(d) list would result in the development of either a State approved management plan or a TMDL. Either of these two activities would have the desired intent to return the water quality to a fully supporting condition that is beneficial to the T& E species and or their critical habitat.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

NOV 3 0 2012

Herschel T. Vinyard
Secretary
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Dear Secretary Vinyard:

The U.S. Environmental Protection Agency, Region 4, has completed our review of the Florida Department of Environmental Protection's (FDEP) amendments to Chapters 62-302 and 62-303 of the Florida Administrative Code. These revisions, which FDEP transmitted to the EPA on June 13, 2012 with the necessary certification from the FDEP General Counsel, establish numeric nutrient criteria for lakes, springs, flowing waters, several estuaries (Tampa Bay, Sarasota Bay, Charlotte Harbor, and Clearwater Harbor/St. Joseph Sound), and South Florida marine waters. These revisions also establish a quantitative approach that the EPA believes will result in better protection for more sensitive downstream waters, such as lakes and estuaries, as well as procedures for developing site-specific alternative criteria. Enclosed in the June 13, 2012 submittal, your office submitted important supportive documentation, including Technical Support Documents (TSDs) and, subsequently, a final September 2012 Implementation Document. These documents provide important information with respect to the scientific basis of FDEP's numeric nutrient standards and FDEP's intentions regarding their implementation.

We have carefully reviewed the amendments to Chapters 62-302 and 62-303, in conjunction with the TSDs and the Implementation Document, and I am pleased to inform you that we find that this package, taken as a whole, comports with the requirements of the Clean Water Act (CWA) and we approve the pertinent provisions for the waters covered as changes to the State's water quality standards in accordance with 40 CFR Part 131, as further described below and in the enclosure and subject to the outcome of consultation under the Endangered Species Act (ESA).

Moreover, FDEP's rules make significant advancements to the approach of reducing nutrient pollution in Florida waters. The hierarchical approach gives preference to local site-specific information that best translates the narrative criteria into numeric values. If site-specific information is not available, the preference is to use a quantifiable stressor-response relationship that represents a well established and reliable scientific approach to development of numeric nutrient values. Where no quantifiable stressor-response relationship has been established, FDEP relied upon reference-based nutrient thresholds as described in the EPA guidance in conjunction with biological information (such as for streams) to derive numeric criteria. Since adverse effects of nutrient over-enrichment primarily manifest themselves through excessive algae and plant production, FDEP's criteria for streams incorporate the use of biological information, such as floral response variables, to identify impaired streams. This biological information augments the reference-based nutrient thresholds. FDEP combines the floral response variables and nutrient thresholds with a response variable to address faunal health (the Stream Condition

Index) and procedures to address non-stable conditions (i.e., increasing trends in nutrient levels). This integrated approach provides a strong basis for protecting streams and downstream waters that is biologically responsive. It builds upon FDEP's extensive experience and technical expertise in assessing water bodies for biological impairment. It also addresses the inherent variability in response to nutrient levels among streams by allowing streams that demonstrate healthy flora and fauna in a stable context to meet the integrated criterion. Importantly, where data are lacking, the State's rules err on the side of caution by listing waters as impaired pending further data collection. This overall hierarchical method to deriving numeric criteria for lakes, springs, streams and estuaries makes for a well-balanced and technically sound approach that is more effective and efficient than FDEP's existing approach of individual interpretations of the narrative for each and every water body in the State.

The EPA's objective is for FDEP to adopt new or revised water quality standards relevant to the control of nutrients for all remaining Florida waters that are determined to be Class I, II, and/or III water bodies, which are covered by EPA's January 14, 2009, determination, thereby possibly eliminating the need for EPA promulgation of federal rules or enabling EPA withdrawal of federal rules. However, to comply with the requirements of the Consent Decree in *Florida Wildlife Federation v. Jackson*, No. 4:08cv324 (N.D. Fla), we are proposing a Phase I remand rule that covers those flowing waters that are Class I and/or III, but whose coverage is uncertain under FDEP's rules, together with numeric downstream protection values (DPVs) for unimpaired lakes. It is our understanding that FDEP's numeric water quality criteria apply to all Class I and/or III flowing waters unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., it is a tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch. It is the EPA's view that any waters excluded by Florida's stream definition that are Class I and/or III still merit the protection afforded by numeric nutrient criteria because these waters may provide important habitat for a diverse range of aquatic plants and animals and may be vulnerable to the effects of nutrient pollution with one exception: The EPA believes that our numeric nutrient criteria are not applicable to wetlands, including intermittent stream segments that the State determines function as wetlands, because fluctuating hydrologic conditions typically result in the dominance of wetland taxa.

Our Phase I remand proposal is not a new exercise of federal authority and it does not currently impose any requirements on the State. Rather, it is a response to the court's decision remanding parts of the Phase I rule for further explanation by the EPA. We recognize that flowing waters that are Class I and/or III and that may be excluded from the definition of streams in the State's rule, as discussed above, may also raise unique issues that would benefit from further discussion with FDEP. We are open to alternative approaches to addressing any Class I and/or III waters that may not be covered by FDEP's rules. We intend to work closely with FDEP to arrive at a path forward that will result in actions by the State that may eliminate the need for our federal rules to be finalized and that will enable us to withdraw the final federal rules for lakes and springs, including model-based numeric downstream protection values (DPVs) for lakes and default DPVs for impaired lakes.

Also, as required by the Consent Decree, we are proposing a Phase II rule that covers the remaining estuaries and coastal waters not covered by FDEP's rules, South Florida flowing waters (with the exception of those waters in the Everglades Agricultural Area and the Everglades Protection), and numeric DPVs for estuaries. With regard to our proposal of numeric DPVs for unimpaired lakes that is contained in our Phase I remand proposal noted above and the numeric DPVs for estuaries in our Phase II proposal, we believe FDEP's quantitative downstream protection approach, in combination with numeric nutrient criteria applicable to streams, springs, lakes, estuaries, and coastal waters, achieves timely and effective protection of downstream waters. That said, while the EPA believes that FDEP's

downstream protection approach is quantitative in nature, the rule provisions themselves do not consist of numeric values, which is what the January 2009 determination and Consent Decree require. In order to acknowledge and accommodate Florida's innovative and protective approach, we are amending our original January 14, 2009, determination by determining that quantitative approaches designed to ensure the attainment and maintenance of downstream water quality standards are sufficient to meet CWA requirements and that numeric DPVs are therefore not necessary in Florida. We will shortly be requesting that the Court modify the Consent Decree to not require numeric criteria for protection of downstream water quality standards based on the amended determination. Provided the Court grants our request to modify the Consent Decree, The EPA will not expect to finalize numeric DPVs for Florida and would expect to propose to withdraw the numeric DPVs for lakes that were upheld as part of the Phase I rule.

We acknowledge and commend FDEP's recent efforts to move forward to adopt numeric nutrient criteria for the Panhandle estuaries. We will continue to work closely with FDEP as they develop numeric criteria for the remaining estuaries and develop a path forward on establishing new or revised water quality standards relevant to the control of nutrients for the remaining coastal and South Florida flowing waters. We are hopeful that these efforts will result in actions by the State that will eliminate the need for our Phase II federal rules to be finalized or for the EPA to be able to withdraw such rules swiftly after any EPA approval of any FDEP numeric nutrient criteria for these waters.

It is our understanding that the provisions of F.A.C. 62-302.531(9) are not triggered by the actions the EPA is taking today, both in this document and in the EPA's Phase I and Phase II proposals. If any interpretation of this provision or any modification or decisions with respect to FDEP's TSDs or the Implementation Document prevents FDEP's numeric nutrient criteria from becoming effective for Florida's lakes, springs or flowing waters or means FDEP will not or cannot implement the rules consistent with the EPA's approval, then the EPA may need to revisit this approval decision to either modify or withdraw it. For those reasons, the EPA reserves its authority to revisit this approval decision in the future should any of these contingencies occur. This would result in our Phase I lakes and springs criteria taking effect and the EPA would possibly proceed to finalize numeric nutrient criteria for all Class I and/or III flowing waters in accordance with our Consent Decree obligations for the Phase I remand rule. The EPA wants and intends to work closely with FDEP with the hope of avoiding any of these contingencies from happening.

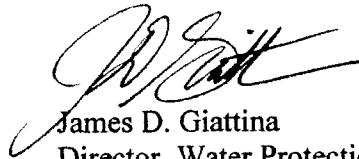
In summary, the EPA is approving the new/revised water quality standards for the waters covered by FDEP's rule in their entirety, consistent with 40 C.F.R. part 131 and the Clean Water Act. As mentioned above, this approval is subject to the outcome of consultation under the ESA; FDEP being able to implement their rule consistent with their Implementation Document and other supporting documents submitted to the EPA by FDEP; interpretation of F.A.C. 62-302.531(9) to allow the EPA to propose and if necessary promulgate NNC for the waters not covered by FDEP's rule; and, with respect to FDEP's downstream protection approach, to the district court modifying the Consent Decree to not require numeric criteria to protect downstream waters (as described above). As a result, the EPA reserves its authority to revisit this approval decision in the future and to modify or withdraw it, as appropriate. In addition, The EPA is proposing to stay the Phase I rule for lakes and springs (and DPVs), which will become effective on January 6, 2013, to November 15, 2013, subject to the district court allowing the EPA to finalize such stay. Further, the EPA is re-proposing numeric criteria for flowing waters and DPVs for unimpaired lakes in accordance with the District Court's February 18, 2012 order. The EPA is proposing the Agency's Phase II rule that addresses estuaries, DPVs for estuaries, coastal waters, and South Florida flowing waters (with the exception of waters in the Everglades Agricultural Area and the Everglades Protection Area), consistent with the Consent Decree. Finally, the EPA is committed to work

with FDEP to arrive at a path forward that will result in actions by the State that may eliminate the need for our federal rules to be finalized (or enable the EPA to withdraw its federal rules swiftly if already finalized) and that will enable us to withdraw the final federal rules for lakes and springs, including model-based numeric downstream protection values (DPVs) for lakes and default DPVs for impaired lakes.

To arrive at our decisions today, there has been extensive coordination between the EPA and FDEP. The EPA also engaged in technical conversations with the National Estuary Programs (NEPs), which were the primary entities that developed the numeric criteria for the estuaries in the rule. These include the Tampa Bay, Sarasota Bay and Charlotte Harbor NEPs. All of these discussions and exchanges of clarifying information were invaluable in the Agency's review process. We greatly appreciate the time and effort of FDEP and the NEPs for the willingness to participate in this informative process.

We want to compliment you on the effort and commitment you and your staff demonstrated in developing your Rules. We believe FDEP's rules, and the supporting documentation you have provided, once implemented, will take a significant step towards protecting and restoring water quality in Florida. We look forward to future communication and collaboration between our Agencies as you move forward with implementation. If you have any questions or concerns, please do not hesitate to call me at (404) 562-9470 or Ms. Joanne Benante at (404) 562-9125.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Giattina', with a stylized flourish at the end.

James D. Giattina
Director, Water Protection Division

Enclosure

Executive Summary

Introduction

On June 13, 2012, the Florida Department of Environmental Protection (FDEP) submitted new and revised water quality standards for review by the U.S. Environmental Protection Agency pursuant to section 303(c) of the Clean Water Act (CWA). These new and revised water quality standards are set out primarily in Rule 62-302 of the Florida Administrative Code (F.A.C.) [Surface Water Quality Standards]. FDEP also submitted amendments to Rule 62-303, F.A.C. [Identification of Impaired Surface Waters], which sets out Florida's methodology for assessing whether waters are attaining State water quality standards. Both Rules 62-302 and 62-303 (referred to collectively as Rule in this Summary) incorporate by reference supporting documentation which was submitted as part of the Rule package. In addition to the supporting technical documentation, FDEP submitted a September 2012 Nutrient Standards Implementation Document. These documents provide important information with respect to the scientific basis for FDEP's numeric nutrient standards and FDEP's intentions regarding their implementation; therefore the EPA has reviewed as a whole the amendments to Chapters 62-302 and 62-303, in conjunction with the technical supporting documents and the Nutrient Standards Implementation Document.

FDEP's new and revised water quality standards include, among other provisions, additions and revisions to the State's definitions and the addition of numeric criteria for springs, lakes, streams, and estuaries, as well as a procedure for developing alternative criteria. The changes made by FDEP reflect an overall effort to interpret the existing nutrient narrative criterion and reflect a hierarchy for criteria development by site-specific analysis, stressor-response relationships, or reference distribution. The following Decision Document provides the details and conclusions of the EPA's review.

Summary of FDEP Rule

FDEP has developed a hierarchical approach to the development of the numeric nutrient Rule. This approach sets out the method by which FDEP will interpret their narrative nutrient criterion which states that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Rule's hierarchical approach gives preference to site-specific analyses that result in numeric interpretations of the narrative criteria.

A hierarchy 1 criterion, the preferred numeric criterion, is obtained with a site-specific analysis such as a total maximum daily load (TMDL), site-specific alternative criterion (SSAC), water quality based effluent limitation (WQBEL), or other FDEP approved action that numerically interprets the narrative criterion. If these site-specific analyses have already been developed or as they become developed in the future, they are considered the numeric interpretation of the narrative criteria under hierarchy 1 and are the applicable criteria for the specific waterbody. If a hierarchy 1 interpretation is not available, the Rule's hierarchical approach then gives preference to numeric nutrient values based on quantifiable stressor-response relationships between nutrients and biological response (*i.e.*, springs and lakes) under hierarchy 2. If no quantifiable stressor-response relationship has been established, such as is the case for Florida streams, reference-based nutrient thresholds, in conjunction with biological information, are used to determine the applicable interpretation of the narrative criteria under hierarchy 3. For those waters without a numeric interpretation under any of these approaches, the narrative criteria continue to apply to the waterbody. This overall method to deriving numeric criteria for lakes, springs, streams and

estuaries makes for a well-balanced and technically sound approach that is more effective and efficient than FDEP's long standing approach of individual interpretations of the narrative for each and every water body in the state. FDEP's hierarchical approach is consistent with 40 CFR 131.11(b)(1)(ii), which allows adoption of water quality criteria by states that "reflect site-specific conditions," and is approved by the EPA pursuant to CWA section 303(c).

Springs Criterion

For springs, FDEP will apply a criterion of 0.35 mg/L of nitrate-nitrite as an annual geometric mean, not to be exceeded more than once in a three consecutive calendar year period for spring vents. The spring vent nitrate-nitrite criterion is based on a hierarchy 2, stressor-response relationship between nitrate-nitrite and the presence of nuisance algal mats, with the criterion established at a concentration that would prevent nuisance mats from occurring. FDEP will assess spring vents against this criterion as part of the five year basin rotation cycle for monitoring and assessing waters. If a spring vent meets the criterion, it is assessed as attaining water quality standards (WQS). If it exceeds the criterion, the spring vent is assessed as impaired and placed on the CWA 303(d) list as requiring a TMDL. The magnitude, frequency and duration of the water quality criterion for nitrate-nitrite adopted by FDEP for spring vents are identical to the criterion published in the EPA's December 2010 final rule, and provide the same level of protection; therefore they are consistent with the requirements of 40 CFR 131.11((b)(1)(iii) and are approved by the EPA pursuant to CWA section 303(c).

Lake Criteria

FDEP has classified lakes into three categories: colored lakes, clear lakes with high alkalinity and clear lakes with low alkalinity. The lakes criteria were based on a hierarchy 2, stressor-response relationship between total nitrogen and total phosphorus (TN and TP) and phytoplankton response (chlorophyll *a*). The lakes chlorophyll criteria were derived using multiple lines of evidence yielding chlorophyll criteria for each of the lake categories. From the chlorophyll criteria, acceptable ranges were determined for TN and TP. All three of these criteria are applied as annual geometric means, not to be exceeded more than once in a three consecutive calendar year period. FDEP will assess lakes against these criteria through their five year basin rotation cycle for monitoring and assessing waters. If a lake's chlorophyll, TN or TP levels are at or below the corresponding criterion, the lake will be assessed as meeting the criteria. Under certain circumstances TN and TP criteria can differ on an annual basis, depending on the current levels of TN and TP, as long as those levels fall within the acceptable ranges and the chlorophyll is below the appropriate threshold. If any of the parameters do not meet the criteria or are outside of the acceptable ranges, the lake is assessed as impaired and placed on the CWA 303(d) list as requiring a TMDL. Based upon the review of the lake criteria including the categorization, chlorophyll criteria, and concentration ranges for TN and TP, the EPA determined the criteria development and implementation to be scientifically defensible and consistent with the requirements of 40 CFR 131.11(b)(1)(iii). Therefore the provisions are approved by the EPA pursuant to CWA section 303(c).

Stream Criteria

For stream criteria, FDEP has developed reference-based nutrient thresholds, in conjunction with biological information, to determine the applicable interpretation of the narrative criteria under hierarchy 3. Despite an exhaustive effort to develop stressor-response relationships between nutrients and biological responses in streams, insufficient responses were observed to develop numeric nutrient

criteria. Therefore, to assess whether a stream attains the narrative criteria, an evaluation of water chemistry and biological data (flora and fauna), is used to determine if a stream's nutrient concentrations are protective of balanced flora and fauna. It is our understanding that FDEP's numeric water quality criteria for streams apply to all Class I and/or III flowing waters (except South Florida flowing waters) unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch.

FDEP's approach to protective stream criteria is based upon the belief that nutrients (TN and TP), in streams are only a problem when in excess, and then only if the excess nutrients stimulate excess plant or algal growth which then has the potential to adversely affect aquatic animals. The amount of excess plant or algal growth impacts aquatic animals by smothering their habitat, disturbing the food webs, or when decomposed, by depleting the available oxygen in the water. These changes in an aquatic system can be expected to show up in biological indicators, such as excessive algal mats, excess water column chlorophyll, excess nuisance vascular plant growth, and/or failing health scores for faunal communities. Adverse changes in these biological endpoints beyond a certain level can be considered evidence of an imbalance of aquatic flora and/or fauna.

Since adverse effects of nutrient over-enrichment primarily manifest themselves through excessive algae and plant production, FDEP's criteria for streams includes information such as floral (plant) response variables to identify impaired streams. This biological information augments the reference-based nutrient thresholds. FDEP follows this approach in the design of the stream criteria by making floral and faunal health considerations critical components of the Rule. Floral imbalance is determined by floral metrics derived by FDEP based on data and scientific information that indicate support for the State's recreation and aquatic life use: "recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife." FDEP has derived floral metrics for chlorophyll levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition. FDEP states that if any one of the floral measures indicates an imbalance, then the stream does not attain the numeric nutrient criteria. These metrics are included in the technical support documents submitted as part of the Rule package and specifically referenced in the Rule itself, and in the Nutrient Standards Implementation Document. Faunal (animal) imbalance is measured by the stream condition index or SCI. The SCI is a biological assessment procedure that measures the degree to which flowing fresh waters support a healthy, well-balanced biological community, as indicated by benthic macroinvertebrates. Attainment of the SCI threshold is an indication that the faunal community of the stream is not being adversely affected by nutrients to the extent that there is a loss in designated use. However, failure of the SCI alone does not necessarily mean that the stressor causing the loss of designated use is nutrients. The numeric nutrient thresholds included in the State Rule are the numeric nutrient criteria derived by the EPA for streams in the December 2010 final rule for Florida's lakes and flowing waters.

For streams, not addressed under a site-specific interpretation under hierarchy 1, FDEP uses a two-part method to interpret the narrative nutrient criterion. For the first part of the two-part method FDEP determines if certain floral responses (demonstrated by undesirable chlorophyll levels, the presence of excessive algal mats or blooms, nuisance aquatic plant growth, and undesirable changes in algal species composition) are each independent indications of imbalanced flora. If they are not, then FDEP concludes there is no imbalance of flora in the waterbody. If any one of these floral measures indicates an imbalance, then the whole of the stream segment is imbalanced. For the second part of the two-part method, FDEP evaluates faunal responses (demonstrated by SCI) and water chemistry (TN and TP

concentrations). If the stream exhibits either an average SCI score of 40 or greater (indicating balanced fauna) or concentrations of TP and TN equal to or less than the established thresholds, FDEP concludes that the waterbody is meeting its designated use.

Due to the complexity of the stream criteria, FDEP submitted an accompanying Nutrient Standards Implementation Document. This document explains how FDEP intends to implement the stream criteria and determine imbalance of flora and fauna. It includes examples and scenarios of how FDEP would assess compliance with the stream criteria and when a stream would be listed on Florida's verified list, study list, or planning list. Note that waters on both the verified and study list are included in the CWA 303(d) list as waters requiring TMDLs.

Following analysis of the rule and SCI Primer, in conjunction with the subsequent clarification provided by the Nutrient Standards Implementation Document, the EPA has determined FDEP's multi-metric criterion has addressed the variability associated with biological response in streams in a reasonable manner and is a scientifically defensible way to achieve protection of the designated uses in the defined streams. This integrated approach provides a strong basis for protecting streams. It builds upon FDEP's extensive experience and technical expertise in assessing water bodies for biological impairment. Therefore, the EPA finds that all components of FDEP's stream criterion, as well as the new or revised water quality standards from the SCI Primer, are consistent with 40 CFR Part 131 and are approved by the EPA pursuant to CWA section 303(c).

Estuary Criteria

Estuary-specific numeric interpretations of the narrative criteria were derived for estuaries along the South and Southwest Coast. This includes: Tampa Bay, Clearwater Harbor, Sarasota Bay, Charlotte Harbor, Clam Bay and South Florida marine waters. FDEP adopted these criteria to protect recreation and a healthy, well-balanced population of fish and wildlife, and included them as hierarchy 1 interpretations. For Tampa Bay, Clearwater Harbor, Sarasota Bay and Charlotte Harbor derivation of numeric criteria was based upon the research, data, and work of the National Estuary Programs or NEPs. The criteria for these estuaries were derived through a collaborative effort to improve and restore sea grass. The conceptual model used is described as a pathway that relates seagrass health through a series of steps back to input of nutrients TN and TP. The steps in the pathway consist of: (1) seagrass growth and reproduction, as controlled by (2) seagrass light requirements, which are in turn affected by (3) light attenuation in the water column, that results in part from (4) chlorophyll which is influenced by (5) TN and TP loads. All southwest estuary criteria, except for Tampa Bay which are expressed as delivery ratios, are expressed as concentrations not to be exceeded more than once in three consecutive years. FDEP developed criteria for the coastal waters of southernmost Florida by grouping those waters geographically into four large south Florida systems (Tidal Coccohatchee River/Ten Thousand Islands, Florida Bay, the Florida Keys, and Biscayne Bay) and then using a maintain healthy conditions approach. Important biological communities, water quality conditions, and nutrient sources were evaluated in each system to establish the status and determine if a system, or part of a system, is meeting the designated use. Using statistics with a prediction interval, FDEP calculated criteria that reflect healthy conditions in the waterbody while shielding against a statistically false positive result (that is, identification of a healthy waterbody as impaired).

FDEP also included a schedule for the development of criteria for the remaining estuaries in the State. A Rule with numeric nutrient criteria for Perdido Bay, Pensacola Bay (including Escambia Bay), St.

Andrews Bay, Choctawhatchee Bay, St. Joseph Bay, and Apalachicola Bay was to be completed by June 30, 2013. However, FDEP adopted numeric nutrient criteria for these estuaries on November 13, 2012 and will be submitting these for EPA review. A Rule for numeric nutrient criteria for the remaining estuaries will be completed by June 30, 2015. The EPA concludes that the criteria provided in FDEP's current rule are protective of healthy, well-balanced biological communities in the waters to which they apply and are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria. Therefore, this provision is approved by the EPA pursuant to CWA section 303(c).

Downstream Protection

Protection of downstream waters is required in FDEP's nutrient Rule by the statement, "The loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters." FDEP will implement this provision by: using models to allocate to upstream watersheds when establishing the TMDL for the downstream waterbody; requiring dischargers, at the time of permit issuance, to provide reasonable assurance that their effluent does not cause or contribute to nutrient impairments in the receiving waterbody and downstream waterbodies; and identifying increasing trends in nutrient concentrations in all waters, including downstream waters, during the assessment cycle. For permitting, if a downstream water is currently attaining its nutrient standards, then current conditions in the upstream waters provide for the attainment condition and therefore loading of nutrients from the waterbody would be limited to current conditions. However, a comprehensive water quality based effluent limit would be required to evaluate the impacts on downstream waters if the facility requests an increase in their permitted load. If a downstream waterbody is not attaining nutrient standards, the permit could not be issued until reasonable assurance was provided that the facility's discharge was not contributing to the impairment. In this case modeling can be used to ensure that loading of nutrients from the upstream waterbody is limited as necessary to provide for the attainment and maintenance of the water quality standards of downstream waters.

The FDEP Rule includes an evaluation of trends to ensure that conditions are not increasing in a manner that could result in impairment downstream. If there is an increasing trend of chlorophyll and the waterbody is expected to become impaired within 5 years, then it is placed on Florida's verified list and CWA 303(d) list for nutrient impairment. FDEP will expedite the development of a TMDL to address and prevent the potential impairment. If there is an increasing trend of chlorophyll, nitrate-nitrite, TN or TP and the waterbody is expected to become impaired within 10 years, then it is placed on Florida's study list and CWA 303(d) list. Applicable studies would be conducted within the current or next listing cycle to determine if the waterbody requires a TMDL. If there is a statistically significant adverse trend in chlorophyll, TN or TP without a projected impairment within 10 years, the waterbody will initially be placed on Florida's planning list so that a more rigorous statistical analysis can be conducted. A determination of impairment status will be made for these waterbodies in the next listing cycle.

FDEP's Rule provides a quantitative process that will serve to ensure the attainment and maintenance of downstream waters by requiring nutrient control measures not only in cases where nutrient impairment has already been documented, but also in cases where nutrient standards are currently met in downstream waters, but maintaining compliance with those nutrient standards is threatened as documented by water quality trends. The State's downstream methodology will enable effective and expeditious development of numeric nutrient levels needed to attain downstream standards. In addition, the EPA has determined pursuant to CWA section 303(c)(4)(B) that numeric values are not necessary to meet CWA requirements with respect to downstream protection. For these reasons, FDEP's downstream

protection provisions are approved by the EPA pursuant to CWA section 303(c) subject to the district court modifying the consent decree to not require the EPA to promulgate numeric downstream protection values (DPVs) in Florida.

Site-Specific Alternative Criteria

FDEP's Rule also includes provisions for site-specific alternative criteria or SSAC for nutrients. This provides a predictable approach to developing nutrient SSACs. The Rule language provides clear expectations on the water quality and biological data needed to characterize existing nutrient concentrations and aquatic health. The EPA determined that FDEP's provision is a scientifically defensible approach for development of SSAC for nutrients, and therefore this provision is approved by the EPA pursuant to CWA section 303(c).

Impaired Waters Rule

FDEP also made changes to their impaired waters Rule (IWR) which include the trend analysis discussed above and provide processes to determine if waterbodies (or waterbody segments) should be placed on the verified list and CWA 303(d) list of impaired waterbodies for subsequent TMDL development. The listings are made in accordance with evaluation thresholds, data sufficiency and data quality requirements in the IWR. The results of the assessment are used to identify waters in each basin for which TMDLs will be developed. The IWR also includes the provision for the new "study list." Pursuant to section 303(c) of the CWA, the EPA has reviewed and is approving those portions of the amended IWR that the Agency has determined to be new or revised water quality standards.

**Decision Document of
United States Environmental Protection Agency Determination
Under § 303(c) of the Clean Water Act
Review of Amendments to Florida's Rule 62-302 and 62-303**

On June 13, 2012, the Florida Department of Environmental Protection (the FDEP or the Department) submitted new and revised water quality standards for review by the U.S. Environmental Protection Agency (the EPA or the Agency) pursuant to section 303(c) of the Clean Water Act (CWA or Act). These new and revised water quality standards (WQS) are set out primarily in Rule 62-302 of the Florida Administrative Code (F.A.C.) [Surface Water Quality Standards]. The State also submitted amendments to Rule 62-303, F.A.C. [Identification of Impaired Surface Waters], which sets out Florida's methodology for assessing whether waters are attaining state water quality standards. As set out more fully below, where the EPA has determined that amendments to Rule 62-302 and/or Rule 62-303 are, themselves, new or revised water quality standards, the EPA has reviewed and approved those revisions pursuant to section 303(c) of the CWA.¹

Both Rules 62-302 and 62-303 incorporate by reference several documents that were submitted as part of the State's documentation. As set out more fully below, where EPA has determined that those documents, or portions of those documents, constitute new or revised water quality standards, the EPA has reviewed and approved those revisions pursuant to section 303(c) of the CWA. In addition, the State submitted a list of Total Maximum Daily Loads (TMDLs), which represent numeric interpretations of the nutrient narrative criterion that the EPA will be reviewing and approving or disapproving as site-specific criteria. Those TMDL-based site-specific criteria submittals will be addressed under separate cover.

Section 303 of the Clean Water Act, 33 U.S.C. § 1313, requires states to establish water quality standards and to submit any revised or new standards to the EPA for approval or disapproval. The revisions addressed in this document were approved for adoption by the Florida Environmental Regulation Commission (ERC) at a public hearing on December 8, 2011. The State Legislature waived the requirement that the rules be ratified by the legislature. Following a multi-day hearing on a challenge to the State rules, Administrative Law Judge Bram D. E. Canter ruled in favor of FDEP on all aspects on June 7, 2012. The Rules were then submitted to the EPA in a letter dated June 13, 2012, from Thomas M. Beason, General Counsel for the FDEP, to Gwendolyn Keyes Fleming, Regional Administrator of the EPA's Region 4 Office. The General Counsel certified that the WQS revisions were duly adopted pursuant to Florida law.

Water quality standards must be based on scientifically defensible methods, pursuant to section 304(a) of the CWA or other scientifically defensible methods. The EPA develops water quality criteria guidance, pursuant to section 304(a) of the Act, based on the latest available scientific knowledge related to the effects of pollutants on water quality. Where states rely on such criteria guidance in developing new or revised water quality standards, the EPA considers those standards to be based on scientifically defensible methods. The EPA has developed 304(a) guidance for the development of

¹ EPA has provided FAQs on "What is a New or Revised Water Quality Standard Under CWA 303(c)(3)?" at <http://water.epa.gov/scitech/swguidance/standards/cwa303faq.cfm>. The link provides detailed information of such analysis.

nutrient criteria.² On December 6, 2010, the EPA published a final rule establishing numeric nutrient criteria, or numeric limits on the amount of total nitrogen, total phosphorus, nitrate-nitrite, and chlorophyll *a* allowed in Florida's inland waters (i.e., lakes, streams and springs except flowing waters in South Florida) while still protecting applicable designated uses (December 2010 final rule).³ In developing those criteria, the EPA relied on the science underlying the Agency's 304(a) guidance and on its review of the latest scientific data and knowledge available regarding the effects of nutrients on waters in Florida. Where FDEP's new or revised water quality standards are consistent with the EPA's guidance or other scientifically defensible methods (e.g., with the EPA's December 2010 final rule), the EPA will consider those standards to be scientifically defensible and protective of CWA 101(a)(2) designated uses (protection and propagation of fish, shellfish, and wildlife and recreation in and on the water).

On January 14, 2009, the EPA issued a determination under CWA section 303(c)(4)(B) that new or revised WQS in the form of numeric water quality criteria for nutrients are necessary to protect the designated uses that Florida has set for its Class I and Class III waters. The FDEP rule does not provide numeric nutrient criteria for all waters of the State that are addressed in the EPA determination (and required to be covered by the consent decree). Specifically the WQS provisions of Chapter 62-302 do not cover South Florida flowing waters, certain estuaries, or coastal waters. The FDEP rule relies on the narrative nutrient standard for protection of these waters (although FDEP has adopted a schedule in rule to adopt numeric nutrient criteria for the remaining estuaries). Because these waters are classified as Class I and/or III waters, EPA has developed proposed numeric nutrient criteria for these waters per the determination and consent decree. EPA will sign a notice of final rulemaking regarding such criteria by the deadlines in the consent decree, and such criteria will remain in place for these waters unless and until FDEP submits new or revised water quality standards relevant to the control of nutrients for such waters, EPA approves such standards, and EPA withdraws federal criteria for these waters. It is our understanding that FDEP's numeric water quality criteria apply to all Class I and/or III flowing waters (except South Florida flowing waters) unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., it is a tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch. EPA understands that, in some cases, there may be questions regarding the appropriate designated use for some of these waters (e.g., hydrologically modified waters/canals), and FDEP has developed a mechanism for addressing those waters through the Class III-Limited Use category, which would involve FDEP conducting a use attainability analysis (UAA), adopting and submitting to EPA a revised designated use of Class III-Limited for such water(s), and EPA approving such revision. It is EPA's view that any waters excluded by Florida's stream definition that are Class I and/or III still merit the protection afforded by nutrient criteria because these waters may provide important habitat for a diverse range of aquatic plants and animals and may be vulnerable to the effects of nutrient pollution.

As set out more fully below, EPA believes that the provisions in FDEP's new or revised water quality standards addressing downstream protection will provide for quantitative approaches to ensure the attainment and maintenance of downstream waters consistent with 40 CFR 131.10(b). The provisions themselves, however, do not consist of numeric values as required by the January 2009 determination.

² EPA's technical guidance documents describing the techniques used to develop nutrient criteria for use in state and tribal water quality standards can be found at:
http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/guidance_index.cfm

³ Federal Register, Vol. 75, No. 233, 75762, December 6, 2010. Water Quality Standards for the State of Florida's Lakes and Flowing Waters.

However, EPA has amended that determination to specify that such numeric DPVs are not necessary in Florida to meet CWA requirements. Because EPA is currently subject to a Consent Decree deadline to sign a rule proposing numeric downstream protection values (DPVs) for Florida by November 30, 2012, EPA is proposing numeric DPVs to comply with the Consent Decree. EPA will ask the court to modify the Consent Decree consistent with the Agency's amended determination, i.e., to not require EPA to promulgate numeric DPVs for Florida. Accordingly, EPA is approving the State's downstream protection provisions subject to the district court modifying the Consent Decree to not require EPA to promulgate numeric DPVs for Florida. If the district court declines to so modify the Consent Decree, EPA expects to revisit its approval of the State Rule's downstream protection provisions to modify or withdraw that approval. Therefore, EPA is reserving its authority to do so in this approval.

We note that FDEP's September 2012 document titled "Implementation of Florida's Numeric Nutrient Standards Document Submitted to the EPA in Support of the Department of Environmental Protection's Adopted Nutrient Standards for Streams, Spring Vents, Lakes, and Selected Estuaries" (Nutrient Standards Implementation Document), addresses how and when the state intends to implement its nutrient criteria.⁴ While EPA does not consider the Implementation Document to include water quality standards, this document provides important insight into the scientific basis for FDEP's numeric nutrient standards and their implementation. EPA's approval of portions of Florida's new or revised water quality standards is based on the Agency's understanding that FDEP will implement the streams criteria as provided in its Nutrient Standards Implementation Document. Due to a recent administrative challenge filed in the State of Florida Department of Administrative Hearings, there is uncertainty as to whether FDEP will be able to implement its newly approved state water quality standards consistent with the Nutrient Standards Implementation Document. If, as a result of the legal challenge, FDEP is unable to implement its Rule as provided in its Nutrient Standards Implementation Document, EPA would intend to revisit portions of its approval of Florida's new or revised water quality standards. EPA has therefore reserved its authority to withdraw or modify portions of this approval.

As set out more fully below, the EPA is approving the Rules submitted by FDEP that are new or revised water quality standards, pursuant to section 303(c) of the CWA. It is our understanding that the provisions of F.A.C. 62-302.531(9) (hereafter "the all-or-nothing provisions") are not triggered by the actions EPA is taking today, both in this approval document and in EPA's Phase I and Phase II proposals. However, if those provisions are interpreted in a manner that prevents FDEP's numeric nutrient criteria from becoming effective for Florida's lakes, springs or flowing waters, or if there are any modifications or decisions with respect to FDEP's TSDs or Nutrient Standards Implementation Document that render the rules unable to be implemented consistent with EPA's approval, then EPA may need to revisit this approval decision to either modify or withdraw it. This would result in our Phase I lakes and springs criteria taking effect and EPA would possibly proceed to finalize numeric nutrient criteria for all Class I and/or III flowing waters in accordance with our Consent Decree obligations.

EPA'S DECISION

⁴ We note that FDEP's Nutrient Standards Implementation Document addresses how and when the state intends to translate its nutrient criteria into NPDES permit limits for point source dischargers. EPA does not consider these permitting procedures to be part of the water quality standards submission and this decision document does not address the Agency's approval or disapproval of these permitting procedures.

Each of FDEP's water quality standards revisions is addressed in detail below along with the EPA's analysis and conclusions.

Overview of Revisions to Chapter 62-302⁵

Review of Non-substantive Revisions to Water Quality Standards

The EPA determined that changes within 62-302.200, including the addition of the phrase "[a]s used in this chapter", the renumbering of the definitions, minor typographical changes to 62-302.200(1), (2), (5), (7), (9)-(15), (18), (20), (21), (34), (38), (40), and (44) [as numbered in the submitted regulatory changes], were editorial, non-substantive changes to Florida's EPA-approved water quality standards. Additional minor typographical changes were made in 62-302.800(1) and 62-302.800(2)(c)2 that were also considered editorial, non-substantive changes to Florida's EPA-approved water quality standards. The EPA approves these editorial, non-substantive changes as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approvals of these editorial, non-substantive changes do not re-open the EPA's prior approvals of the underlying substantive water quality standards.

Review of Remaining Revisions

Definitions

Rule 62-302.200

The Department made a number of changes to the definitions set out in Rule 62-302.200, as described in more detail below. Note that the subsection numbers correspond to the appropriate numbers in the revised Rule.

Subsection 62-302.200(4)

The definition of "biological health assessment" was added and reads as follows:

(4) "Biological Health Assessment" shall mean one of the following aquatic community-based biological evaluations: Stream Condition Index (SCI), Lake Vegetation Index (LVI), or Shannon-Weaver Diversity Index.

This definition describes the listed biological indices as types of "biological health assessments" and limits application of that term to those listed biological indices. This definition creates an umbrella term for the three listed biological indices used in Florida's standards, each of which is a new or revised WQS in its own right. The EPA previously approved a definition of "bioassessment" in Florida's Impaired Waters Rule (IWR), at 62-303.200(1). Section 62-302.200(4) revises that definition. The definition of each individual biological index is discussed below. This definition is consistent with 40 CFR part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act. The EPA also notes that the revisions to this definition also affect the use of the term "biological health assessment" in other parts of Florida WQS, since an assessment of a water body's biological health that is required under

⁵ Unless otherwise stated, all rule and subsection citations are to provisions in the Florida Administrative Code.

other provisions of the WQS is now limited to an evaluation using one of these three indices that evaluate the aquatic community.

Subsection 62-302.200(16)

The definition of “lake” was added and reads as follows:

(16) “Lake” shall mean, for purposes of interpreting the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., a lentic fresh waterbody with a relatively long water residence time and an open water area that is free from emergent vegetation under typical hydrologic and climatic conditions. Aquatic plants, as defined in subsection 62-340.200(1), F.A.C., may be present in the open water. Lakes do not include springs, wetlands, or streams (except portions of streams that exhibit lake-like characteristics, such as long water residence time, increased width, or predominance of biological taxa typically found in non-flowing conditions).

This provision defines the physical extent that water quality criteria adopted for freshwater lakes in 62-302.531(2)(b)1. apply and thus establishes expectations for certain ambient fresh waters. The EPA previously approved a definition of “lake” in Florida’s Impaired Waters Rule (IWR), at 62-303.200(8). That provision was also revised during the State’s nutrient rulemaking and is addressed more fully below. The EPA notes that the definition of “lake” in 62-302.200(16) now differs slightly from the definition in 62-303.200(8), in that the 62-302.200(16) definition limits the applicability of the definition to “purposes of interpreting the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C.”

The EPA used a similar definition in its December 2010 final rule.⁶ Florida’s definition specifically includes the portions of streams that exhibit characteristics of lakes. The State’s definition also states that lakes are free from emergent vegetation under typical hydrologic and climatic conditions, and that aquatic plants⁷ may be present in lakes.

Florida’s additional descriptions and restrictions clarify further the intended use of this water body type as it relates to application of nutrient criteria.

Based on the EPA’s review, a water body classified as a lake when implementing the December 2010 final rule will also be considered as a lake under the State’s definition. Therefore, the EPA agrees that the definition is appropriate to delineate freshwater water bodies in the application of nutrient water quality criteria for lakes. For the reasons explained in the EPA’s December 2010 final rule, this definition is consistent with 40 CFR part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(17)

The definition of “lake vegetation index” was added and reads as follows:

⁶ The EPA promulgated the following definition of “lake” in the Agency’s December 2010 final rule: “a slow-moving or standing body of freshwater that occupies an inland basin that is not a stream, spring, or wetland.” Federal Register Vol. 75, No. 233, Page 75805.

⁷ F.A.C. 62-340.200 defines aquatic plant as “a plant, including the roots, which typically floats on water or requires water for its entire structural support, or which will desiccate outside of water.”

(17) "Lake Vegetation Index (LVI)" shall mean a Biological Health Assessment that measures lake biological health in predominantly freshwaters using aquatic and wetland plants, performed and calculated using the Standard Operating Procedures for the LVI in the document titled *LVI 1000: Lake Vegetation Index Methods* (DEP-SOP-003/11 LVI 1000) and the methodology in *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (DEP-SAS-002/11), both dated 10-24-11, which are incorporated by reference herein. Copies of the documents may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

The LVI is one of the three aquatic assessments included in the term "biological health assessments" in 62-302.200(4), above. The LVI is a new biological assessment criterion, replacing the Lake Condition Index (LCI). The LVI is applied in 62-303.330(3)(d) and 62-303.430(2)(a) and (c), where specific levels of the index are used to execute decisions that waters do not meet the narrative criterion and thus do not attain WQS. Those provisions are addressed later in this document. This provision, as applied in 62-303.330 and 62-303.430, defines an ambient condition of water that supports an aquatic life designated use and therefore establishes a level of protection that is applied to a water body. The LVI is also applied in 62-302.800(3), as part of the qualifying conditions for a demonstration that the narrative nutrient criteria in 62-302.530(47)(b) are met in the process of establishing a Type III Site Specific Alternative Criteria (SSAC) for nutrients. The revised definition of LVI further defines a new biological assessment criterion to Florida's currently approved water quality criteria for biological integrity contained in 62-302.530(10).

The definition is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act because it helps to clarify which tests the State will use when conducting biological health assessments. The actual index and corresponding scoring system is discussed later in this document.

This provision also references two documents, *LVI 1000: Lake Vegetation Index Methods* (LVI 1000) and *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (the LVI Primer), which contain the information on how to complete the steps that are necessary to conduct a biological health assessment based on the LVI for freshwater lakes. These documents are not new or revised WQS for the purposes of the EPA's CWA section 303(c) review, since they only contain the details of analytical procedures that are used to calculate the LVI, a relative index of biological health for freshwater lakes. The EPA also notes that this definition is repeated in 62-303.200(9).

Subsection 62-302.200(19)

The definition of "natural background" was revised as follows:

(19) (16) "Natural Background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, or on historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background

conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped according to ambient total phosphorus and total nitrogen concentrations in the following lake zones:

(a) The TP1 phosphorus zone consists of the USEPA Lake Regions 65-03, and 65-05.

(b) The TP2 phosphorus zone consists of the USEPA Lake Regions 75-04, 75-09, 75-14, 75-15 and 75-33.

(c) The TP3 phosphorus zone consists of the USEPA Lake Regions 65-01, 65-02, 75-01, 75-03, 75-05, 75-11, 75-12, 75-16, 75-19, 75-20, 75-23, 75-24, 75-27, 75-32 and 76-03.

(d) The TP4 phosphorus zone consists of the USEPA Lake Regions 65-04, 75-02, 75-06, 75-08, 75-10, 75-13, 75-17, 75-21, 75-22, 75-26, 75-29, 75-31, 75-34, 76-01 and 76-02.

(e) The TP5 phosphorus zone consists of the USEPA Lake Regions 75-18, 75-25, 75-35, 75-36 and 76-04.

(f) The TP6 phosphorus zone consists of the USEPA Lake Regions 65-06, 75-07, 75-28, 75-30 and 75-37.

(g) The TN1 nitrogen zone consists of the USEPA Lake Region 65-03.

(h) The TN2 nitrogen zone consists of the USEPA Lake Regions 65-05 and 75-04.

(i) The TN3 nitrogen zone consists of the USEPA Lake Regions 65-01, 65-02, 65-04, 75-01, 75-02, 75-03, 75-09, 75-11, 75-15, 75-20, 75-23, 75-33 and 76-03.

(j) The TN4 nitrogen zone consists of the USEPA Lake Regions 65-06, 75-05, 75-06, 75-10, 75-12, 75-13, 75-14, 75-16, 75-17, 75-18, 75-19, 75-21, 75-22, 75-24, 75-26, 75-27 and 75-29, 75-31, 75-32, 75-34 and 76-02.

(k) The TN5 nitrogen zone consists of the USEPA Lake Regions 75-07, 75-08, 75-25, 75-28, 75-30, 75-35, 75-36, 75-37, 76-01 and 76-04.

The Lake Regions document may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

This provision references a document, *Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR)*, which contains information on lake location and characteristics. This document is not a new or revised WQS for the purposes of the EPA's CWA section 303(c) review, since it only contains reference material relating to previous lake research completed for the studied lakes.

The addition of "paleolimnological examination of sediment cores" and "examination of geology and soils" to the "natural background" definition provides two additional methods for documenting natural background. FDEP has also added a third method for considering natural background TP and TN concentrations in lakes, based on a previous EPA study completed for Florida lakes, with subsequent refinement by a representative of the Florida Lake Watch program.

By adding these three methods, the State is clarifying the types of analyses available to support a conclusion of what would be expected as the natural background condition for a given waterbody. The first two options provide a narrative description of the type of analyses, while the third option provides TP and TN zones "grouped according to ambient [concentrations]" specifically for lakes. These types of

analyses are likely to be useful in future applications of the State's SSAC provisions when determining whether an elevated TP or TN concentration is the result of a natural background condition. Any application of this provision that results in a change to the existing water quality standard would be subject to the normal state rulemaking and EPA review processes at that time. The EPA does not consider any of these methods, alone, to be sufficient to demonstrate natural conditions, absent a site-specific demonstration that the method is appropriate to establish background for a particular lake.

Therefore, these revisions are consistent with 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(22)

The definition of "nutrient" was added and reads as follows:

(22) "Nutrient" shall mean total nitrogen (TN), total phosphorus (TP), or their organic or inorganic forms.

This provision creates a term that serves to make the component terms operable in this rule. The definition also clarifies what is meant by "nutrient" in terms of the State's narrative criteria for nutrients, the numeric interpretations of the narrative criteria, and any other application of the term "nutrient" within Florida's water quality regulations. The State's definition of "nutrient" is consistent with the EPA's 304(a) guidance on nutrient criteria⁸, 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(23)

The definition of "nutrient response variable" was added and reads as follows:

(23) "Nutrient response variable" shall mean a biological variable, such as chlorophyll *a*, biomass, or structure of the phytoplankton, periphyton or vascular plant community, that responds to nutrient load or concentration in a predictable and measurable manner. For purposes of interpreting paragraph 62-302.530(47)(b), F.A.C., dissolved oxygen (DO) shall also be considered a nutrient response variable if it is demonstrated for the waterbody that DO conditions result in biological imbalance and the DO responds to a nutrient load or concentration in a predictable and measurable manner.

The first sentence of this provision defines a term, "nutrient response variable," that serves to make the component terms operable in this rule. The addition of the second sentence adds dissolved oxygen to the list of "nutrient response variables," when the biological response to DO can be attributed to nutrient concentration or load. Both of these sentences refer to a response to causal nutrient concentrations in a "predictable and measurable manner." FDEP's Nutrient Standards Implementation Document, provides additional detail regarding how the term "predictable and measurable" is defined.

⁸ Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs [EPA-822-B-00-001], Nutrient Criteria Technical Guidance Manual: Rivers and Streams [EPA-822-B-00-002], and the November 14, 2001 Memorandum from Geoff Grubbs titled *Development and Adoption of Nutrient Criteria into Water Quality Standards*.

Standard statistical tests, such as regression or other appropriate empirical or deterministic models, are used to demonstrate a “predictable and measurable” DO response to nutrients. The p value associated with the regression or other statistical model should be less than 0.05 and the variability in DO explained by nutrients should be sufficient (e.g., $r^2 \geq 0.25$) to expect that nutrient reductions would lead to improvements in DO and maintain or restore a healthy, well balanced biological community. (Page 33 of Nutrient Standards Implementation Document)

The State’s definition of “nutrient response variable” is consistent with the EPA’s 304(a) guidance and policy on nutrient criteria⁹, 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

The EPA notes that the second sentence of 62-302.200(23) is operative only for purposes of 62-302.530(47)(b). Rule 62-3-2530(47)(a) continues to require the discharge of nutrients to be limited as needed to prevent violations of other standards contained in chapter 62-302. The requirement in 62-302.200(23) that DO will act as a nutrient response variable only if it is demonstrated that DO conditions in a particular waterbody result in biological imbalance does not apply in instances where nutrient levels contribute to non-attainment of the state DO water quality criteria.

Subsection 62-302.200(24)

The definition of “nutrient threshold” was added and reads as follows:

(24) “Nutrient Threshold” shall mean a concentration of nutrients that applies to a Nutrient Watershed Region and is derived from a statistical distribution of data from reference or benchmark sites. Nutrient Thresholds are only applied to streams as specified in paragraph 62-302.531(2)(c), F.A.C.

This provision makes clear what numeric nutrient criteria, or “nutrient thresholds” as defined by the State, apply to streams. The remaining terminology (“nutrient watershed region”) and concepts (criteria selection and application to streams) are discussed elsewhere in this document. The definition is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(25)

The definition of “nutrient watershed region” was added and reads as follows:

(25) “Nutrient Watershed Region” shall mean a drainage area over which the nutrient thresholds in paragraph 62-302.531(2)(c), F.A.C., apply.

⁹ Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs [EPA-822-B-00-001]. Nutrient Criteria Technical Guidance Manual: Rivers and Streams [EPA-822-B-00-002], and the November 14, 2001 Memorandum from Geoff Grubbs titled *Development and Adoption of Nutrient Criteria into Water Quality Standards*.

- (a) The Panhandle West region consists of the Perdido Bay Watershed, Pensacola Bay Watershed, Choctawhatchee Bay Watershed, St. Andrew Bay Watershed, and Apalachicola Bay Watershed.
 - (b) The Panhandle East region consists of the Apalachee Bay Watershed, and Econfina/Steinhatchee Coastal Drainage Area.
 - (c) The North Central region consists of the Suwannee River Watershed and the “stream to sink” region in Alachua, Marion and Levy Counties that is affected by the Hawthorne Formation.
 - (d) The West Central region consists of the Peace, Myakka, Hillsborough, Alafia, Manatee, Little Manatee River Watersheds, Sarasota/Lemon Bay Watershed and small, direct Tampa Bay tributary watersheds south of the Hillsborough River Watershed.
 - (e) The Peninsula region consists of the Waccasassa Coastal Drainage Area, Withlacoochee Coastal Drainage Area, Crystal/Pithlachascotee Coastal Drainage Area, small, direct Tampa Bay tributary watersheds west of the Hillsborough River Watershed, small, direct Charlotte Harbor tributary watersheds south of the Peace River Watershed, Caloosahatchee River Watershed, Estero Bay Watershed, Imperial River Watershed, Kissimmee River/Lake Okeechobee Drainage Area, Loxahatchee/St. Lucie Watershed, Indian River Watershed, Daytona/St. Augustine Coastal Drainage Area, St. John’s River Watershed, Nassau Coastal Drainage Area, and St. Mary’s River Watershed.
 - (f) The South Florida region consists of those areas south of the Peninsula region, such as the Cocohatchee River Watershed, Naples Bay Watershed, Rookery Bay Watershed, Ten Thousand Islands Watershed, Lake Worth Lagoon Watershed, Southeast Coast – Biscayne Bay Watershed, Everglades Watershed, Florida Bay Watershed, and the Florida Keys.
- A map of the Nutrient Watershed Regions, dated October 17, 2011, is incorporated by reference herein and may be obtained from the Department’s internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

A given Nutrient Watershed Region (NWR), as specifically described above, defines the physical areas where the previously described nutrient concentration values for streams apply. In addition, the provision incorporates by reference a map of the nutrient regions. This locational information, both in narrative format and the referenced map, defines where the criteria apply and therefore lays out the expectation of water quality for these ambient waters in each NWR.

In the December 2010 final rule, the EPA established five separate NWRs, which were composed of individual watersheds based on NOAA coastal, estuarine, and fluvial drainage areas with modifications to the NOAA drainage areas in the West Central and Peninsula Regions that account for unique watershed geologies. The State’s definition of NWR differs in three aspects from the regions developed by the EPA in its December 2020 final rule. The differences include: the Sarasota/[Lemon] Bay watershed is now listed within the West Central region instead of the Peninsula, the Imperial River watershed is newly listed in the Peninsula region, and the addition of the phrase “and the ‘stream to sink’ region in Alachua, Marion and Levy Counties that is affected by the Hawthorne Formation” to the North Central region.

Where the EPA's December 2010 final rule has already provided the documentation to support the above described geographic locations as appropriate nutrient watershed regions¹⁰, no further review was completed. However, where the geographic locations differ from those established in the EPA's December 2010 final rule, the Agency reviewed the submitted materials from the State and found that the differences from the federal rule are due to consideration of additional information, described in *FDEP's Technical Support Document: Development of Numeric Nutrient Criteria for Florida Lakes, Springs Vents and Streams (2012)* (FDEP's Freshwater TSD). Pages 86 through 93 of FDEP's Freshwater TSD further explains the specific details of the State's analysis of "more recent geological information and watershed connections." The following text was also provided by FDEP on August 24, 2012, in a document titled "DEP's Responses to EPA's Questions and Requests for Clarification," (FDEP's Q&A Document) to further explain the newer geologic information.

Sarasota Area

The "Hydrogeologic Framework of the Southwest Florida Water Management District", which was published in 2008 by the DEP (Arthur et al., Florida Geologic Bulletin No. 68) in cooperation with the SWFWMD, is the most up-to-date and thorough analysis of geology in this area. When mapped, the data show the phosphorus rich Hawthorn Formation to be widely distributed near the ground surface in Sarasota County (Figure 2). The data show Sarasota County to be influenced by naturally occurring phosphorus and that Sarasota Bay and Lemon Bay Watersheds should more appropriately be included in the West Central Nutrient Watershed Region than in the Peninsula (Figure 3). The analysis of the data from the 2008 geologic report clearly shows that phosphorus rich deposits are present in Sarasota County in both of the major coastal Estuarine Drainage Areas (EDA). Water quality data demonstrates that freshwater concentrations are very similar in the existing Peninsular and West Central Regions (Figure 4). Applying the Peninsular total phosphorus standards to the coastal EDAs will result in the erroneous conclusion that natural levels of phosphorus are due to anthropogenic inputs.

Alachua County Area

After consulting with local scientists, DEP concluded that the areal extent over which water quality is influenced by naturally occurring phosphorus deposits in Alachua County was more extensive than either DEP or EPA originally realized. There is a group of "stream to sink" watersheds along the Central Florida Ridge that DEP ultimately included in the North Central NWR. After capture by the sinkholes, the groundwater flow in this area is to the north/northwest, toward the Santa Fe and Suwannee Rivers, both of which are in the North Central region (Figure 5). Based on direct observations by DEP staff, streams in this area down-cut through the phosphorus-rich Hawthorn Group and discharge to the Floridan aquifer through these active sink holes.

Additional descriptions of the changes to the nutrient regions are provided in the TSD (p.86 [and 92]).

¹⁰ The regions developed by EPA in its Final Rule can be found at 40 CFR 131.43(c)(2). The basis for the regionalization in EPA's Final Rule, as well as a map of the regions, is provided in Chapter 1 of *Technical Support Document for U.S. EPA's Final Rule for Numeric Criteria for Nitrogen/Phosphorus Pollution in Florida's Inland Surface Waters*.

The inclusion of the Imperial River watershed simply appears to be a clarification to add the name of this watershed within the Peninsula Region watersheds listed at 62-302.200(25)(e). In DEP's Responsiveness Summary, dated April 30, 2012, the State replied, "[t]he peninsula region extends to and includes the Imperial River." Response to Comment Number 16. Since there appears to be no difference in coverage, no further review of the inclusion of the "Imperial River Watershed" is required for the reasons already described above.

In conclusion, the EPA has determined that the information submitted by FDEP provides a sound scientific basis for the NWR set out in the state rule. Therefore, the geographical information adopted by the State, although different from the EPA's December 2010 final rule, is consistent with 40 CFR 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(29)

The definition of "predominantly fresh waters" was revised and now provides:

(29) ~~(22)~~ "Predominantly fFresh wWaters" shall mean surface waters in which the chloride concentration at the surface is less than 1,500 milligrams per liter or specific conductance is less than 4,580 µmhos/cm.

The intended objective of this definition is to establish a clear distinction between freshwater and marine environments, which have significant differences in water chemistry and adapted aquatic life. In practice, the definition functions to determine application of appropriate criteria to a given waterbody to provide protection for the characteristic life. Deletion of the text "at the surface" from the above definition of "predominantly fresh waters" removes a qualifying restriction in the use of this definition to distinguish between fresh and marine waters. This becomes particularly important at or near the natural boundaries between the two, where mixing is complicated and the actual interface tends to be very dynamic, typically driven by tides, seasonal hydrology, local bathymetry, etc. Measurement of salinity only at the surface does not accurately characterize the predominant salinity in this zone, which is often stratified vertically. A fluctuating range of salinity in this zone (vertically and/or horizontally) is a natural phenomenon to which the aquatic life utilizing this zone has become specifically adapted to tolerate and exploit. This change in definition should not affect the level of protection, but will allow a definitive characterization of waters. A more accurate distinction between fresh and marine waters will allow for more appropriate application of fresh and marine criteria. (FDEP's "Overview of Approaches for Numeric Nutrient Criteria Development in Marine Waters" (Marine Overview TSD), pp. 2, 63-69; FDEP's Response to Public Comments, Comment # 219).

Addition of the phrase "or specific conductance is less than 4,580 µmhos/cm" to the definition above provides an alternative to chloride concentration as a reliable surrogate for salinity that may be used for determination of the effective salinity in the State's waters. In the FDEP's Q&A Document, on page 28, responses number 3, FDEP states, "[b]ecause there is a well known, established relationship between chloride, conductivity, and salinity, and because conductivity data are far more available than chloride data (which was formerly required), DEP chose to add the equivalent conductivity value as an alternate way to determine the fresh versus marine waters distinction." Therefore, since a specific conductance of 4,580 µmhos/cm can be considered equivalent to a chloride concentration of 1,500 mg/L, with both being representative of the same level of salinity, this change in definition should not affect the level of

protection provided by distinction of freshwater from marine water, but will allow the State enhanced capability for characterizing waters where data for either parameter is available.

These two specific refinements serve to make the definition of the term, “predominantly fresh waters” more precisely operable in this rule and to the application of the included criteria. As defined and based on the above discussion, the State’s interpretation of what constitutes “predominantly fresh waters” for the purposes of this rule is consistent with 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(30)

The definition of “predominantly marine waters” was revised and now provides:

(30) (23) “Predominantly mMarine wWaters” shall mean surface waters in which the chloride concentration at the surface is greater than or equal to 1,500 milligrams per liter or specific conductance is greater than or equal to 4,580 μ mhos/cm.

Similar to the preceeding term, the intended objective of this definition is to establish a clear distinction between marine and freshwater environments, which have significant differences in water chemistry and adapted aquatic life. In practice the definition functions to determine application of appropriate criteria to a given waterbody to provide protection for the characteristic life. Deletion of the text, "at the surface" from the above definition of “predominantly marine waters” removes a qualifying restriction in the use of this definition to distinguish between marine and fresh waters. This becomes particularly important at or near the natural boundaries between the two, where mixing is complicated and the actual interface tends to to be very dynamic, typically driven by tides, seasonal hydrology, local bathimetry, etc. Measurement of salinity only at the surface does not accurately characterize the predominant salinity in this zone which is often stratified vertically. A fluctuating range of salinity in this zone (vertically and/or horizontally) is a natural phenomenon to which the aquatic life utilizing this zone has become specifically adapted to tolerate and exploit. This change in definition should not affect the level of protection, but will allow a definitive characterization of waters. A more accurate distinction between marine and fresh waters will allow for more appropriate application of fresh and marine criteria. (Marine Overview TSD, pp. 2, 63-69; FDEP's Response to Public Comments, Comment # 219).

Addition of the phrase "or specific conductance is less than 4,580 μ mhos/cm" to the definition above provides an alternative to chloride concentration as a reliable surrogate for salinity that may be used for determination of the effective salinity in the State's waters. In FDEP’s Q&A Document, on page 28, response number 3, FDEP states, "[b]ecause there is a well known, established relationship between chloride, conductivity, and salinity, and because conductivity data are far more available than chloride data (which was formerly required), DEP chose to add the equivalent conductivity value as an alternate way to determine the fresh versus marine waters distinction." Therefore, since a specific conductance of 4,580 μ mhos/cm can be considered equivalent to a chloride concentration of 1,500 mg/L, with both being representative of the same level of salinity, this change in definition should not affect the level of protection provided by distinction of marine from fresh water, but will allow the State enhanced capability for characterizing waters where data for either parameter is available.

These two specific refinements serve to make the definition of the term, “predominantly marine waters” more precisely operable in this rule and to the application of the included criteria. As defined and based

on the above discussion, the State's interpretation of what constitutes "predominantly marine waters" for the purposes of this rule is consistent with 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(35)

The definition of "spring vent" was added and reads as follows:

(35) "Spring vent" shall mean a location where groundwater flows out of a natural, discernable opening in the ground onto the land surface or into a predominantly fresh surface water.

This provision, in conjunction with the State's definition of surface water,¹¹ defines the physical extent that water quality criteria adopted for spring vents in 62-302.531(2)(b)2 apply to freshwaters, and thus establishes legal expectations for certain ambient fresh waters. The EPA notes that the same definition for spring vent was adopted by the State in 62-303.200(27).

The EPA used a similar definition in the December 2010 final rule.¹² Florida's definition includes a restriction that a spring vent flows into freshwaters, which is the same as the EPA's approach, as the Agency's final rule applies to inland waters only. Based on the EPA's review, a water body classified as a spring when implementing the December 2010 final rule will also be considered as a spring under the State's definition of spring vent. Therefore, the EPA agrees that the definition is appropriate to delineate freshwater water bodies in the application of water quality criteria for spring vents. This definition is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(36)

The definition of "stream" was added and reads as follows:

(36) "Stream" shall mean, for purposes of interpreting the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., under paragraph 62-302.531(2)(c), F.A.C., a predominantly fresh surface waterbody with perennial flow in a defined channel with banks during typical climatic and hydrologic conditions for its region within the state. During periods of drought, portions of a stream channel may exhibit a dry bed, but wetted pools are typically still present during these conditions. Streams do not include:
(a) non-perennial water segments where fluctuating hydrologic conditions, including periods of desiccation, typically result in the dominance of wetland and/or terrestrial taxa (and corresponding reduction in obligate fluvial or lotic taxa), wetlands, or portions of streams that exhibit lake characteristics (e.g., long water residence time, increased width, or predominance of biological taxa typically found in non-flowing conditions) or tidally influenced segments that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions; or

¹¹ F.A.C. 62-302.200(38) defines surface water as water upon the surface of the earth, whether contained in bounds created naturally or artificially or diffused. Water from natural springs shall be classified as surface water when it exits from the spring onto the earth's surface.

¹² The December 2010 final rule defined "spring" as "a site at which ground water flows through a natural opening in the ground onto the land surface or into a body of surface water." Federal Register Vol. 75, No. 233, Page 75805.

(b) ditches, canals and other conveyances, or segments of conveyances, that are man-made, or predominantly channelized or predominantly physically altered and;
1. are primarily used for water management purposes, such as flood protection, stormwater management, irrigation, or water supply; and
2. have marginal or poor stream habitat or habitat components, such as a lack of habitat or substrate that is biologically limited, because the conveyance has cross sections that are predominantly trapezoidal, has armored banks, or is maintained primarily for water conveyance.

This provision defines the physical area where the provisions of 62-302.531(2)(c) apply and thus helps set legal expectations for ambient waters. The EPA notes that this definition differs from the revisions to the same definition in 62-303, in that the 62-303.200(28) definition applies a more general definition for use within chapter 62-303. In addition, the EPA used a broader definition of streams in the December 2010 final rule¹³ than either the 62-302 or 62-303 revised definitions.

Through this definition, the State has chosen to limit the application of the “stream” criteria adopted in 62-302.531(2)(c) to a subset of the State’s Class I and III flowing waters. Pursuant to 62-302.531(1), the narrative nutrient provisions remain the applicable water quality standards for those flowing waters that are not defined as a “stream” for purposes of 62-302.531(2)(c). It is our understanding that FDEP’s numeric water quality criteria apply to all Class I and/or III flowing waters unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., it is a tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch.

Providing a very descriptive narrative for where a specific criterion is intended to apply is within the State’s discretion in its criteria development process. The State decided that it was appropriate to apply numeric values to a subset of their waterbodies because such application would be consistent with the scientific procedures and methods used to establish the numeric nutrient concentrations to other waterbodies. The State explains its basis for limiting the numeric criteria to “streams” in Section 1.4 of FDEP’s Freshwater TSD. The Freshwater TSD sets out why numeric criteria are inappropriate for 1) artificial, predominantly channelized, or predominantly altered systems, 2) non-perennial water segments, 3) wetlands, and/or 4) streams that exhibit lake-like characteristics. For artificial, predominantly channelized, or predominantly altered systems, the State concludes on page 4 of the Freshwater TSD that the data used to derive the stream nutrient thresholds “did not include canals or manmade/altered conveyances.” The FDEP Nutrient Technical Advisory Committee recommended the use of the benchmark site approach where a site-specific assessment of biological response to nutrients could be made for benchmark candidate waters, however, there is not a tool available to perform biological assessments for canals and other altered systems. Similarly, non-perennial water segments are excepted from the definition of stream because these types of waters are not represented in the “reference site data distribution” used to develop FDEP’s nutrient thresholds. Under the FDEP rule, these two categories of waterbodies, as well as wetlands, will continue to be protected by the narrative criteria until scientific information allowing derivation of numeric nutrient criteria are available for these three types of waters. For streams that exhibit lake-like characteristics, FDEP determined that the

¹³ The December 2010 final rule defined “stream” as “a free-flowing, predominantly fresh surface water in a defined channel, and includes rivers, creeks, branches, canals, freshwater sloughs, and other similar water bodies.” Federal Register Vol. 75, No. 233, Page 75805.

numeric lake criteria more appropriately address protection of the designated uses in lake-like flowing waters. Lastly, the reasons for excluding application of numeric criteria to “tidally influenced segments that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions” are described on pages 1, 2, and 64 of FDEP’s Marine Overview TSD. Generally, FDEP concluded that there is insufficient information to develop accurate criteria for these waters. In the Marine Overview TSD, FDEP concluded that because “the mouths of tributary rivers or streams would generally not be representative of the mixed, open water portions [and] would not be part of the original data distribution from which the criteria were developed” it would not be appropriate to apply the stream criteria to these types of waters.

States have the authority to decide the areal extent of state water quality criteria. Therefore, the EPA finds that these revisions to the stream definition as consistent with 40 CFR Part 131 and the CWA and is approving them pursuant to section 303(c) of the Act. By approving these restrictions on the areal extent of FDEP’s numeric nutrient criteria for flowing waters, however, the EPA is not making any decision as to whether numeric nutrient criteria are necessary or possible to derive for those flowing waters not covered by the State’s rule.

Subsection 62-302.200(37)

The definition of “stream condition index” was added and reads as follows:

(37) “Stream Condition Index (SCI)” shall mean a Biological Health Assessment that measures stream biological health in predominantly freshwaters using benthic macroinvertebrates, performed and calculated using the Standard Operating Procedures for the SCI in the document titled *SCI 1000: Stream Condition Index Methods* (DEP-SOP-003/11 SCI 1000) and the methodology in *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11), both dated 10-24-11, which are incorporated by reference herein. Copies of the documents may be obtained from the Department’s internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. For water quality standards purposes, the Stream Condition Index shall not apply in the South Florida Nutrient Watershed Region.

The definition for Stream Condition Index (SCI) is applied in multiple provisions of 62-302 and 62-303. The SCI provides a measurement of biological integrity and indicates an adverse response in the macroinvertebrate community. A failing score indicates that the macroinvertebrate community has been subject to some form of stress, which could include excess nutrient enrichment. This definition, and its applications in 62-302.531(2)(c), 62-302.800(3), 62-303.330, and 62-303.430, define an ambient condition of water that supports an aquatic life designated use and therefore establish a level of protection that is applied to a water body. The provisions of 62-302 and 62-303 which apply the SCI are addressed later in this document. The definition of the SCI, and its inapplicability to the South Florida Nutrient Watershed Region, further define a new biological assessment criterion, in addition to Florida’s currently approved biological water quality criteria contained in 62-302.530(10).

This provision also references two documents, *SCI 1000: Stream Condition Index Methods* (SCI 1000) and *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11), which contain the procedures and methodology for conducting a biological health

assessment in freshwater streams. The first document, and portions of the second document, were determined to not be new or revised WQS for the purposes of the EPA's CWA section 303(c) review, since they contain the details of the procedures that are used to calculate the SCI, a relative index of biological health for streams, and other guidance on when use of the SCI may be informative to various water quality management or criteria processes. The EPA's review of portions of the second document which were determined to be new or revised water quality standards will be discussed within the analysis of the provision 62-302.531(2)(c).

The definition is consistent with 40 CFR Part 131 and the CWA because it helps to clarify which tests the State will use when conducting biological health assessments and is approved by the EPA pursuant to section 303(c) of the Act. The actual index and corresponding score is discussed later in this document.

Subsection 62-302.200(39)

The definition of "total maximum daily load" was added and reads as follows:

(39) "Total Maximum Daily Load" (TMDL) for an impaired waterbody or waterbody segment shall mean the sum of the individual wasteload allocations for point sources and the load allocations for nonpoint sources and natural background. Prior to determining individual wasteload allocations and load allocations, the maximum amount of a pollutant that a waterbody or water segment can assimilate from all sources without exceeding water quality standards must first be calculated. A TMDL shall include either an implicit or explicit margin of safety and a consideration of seasonal variations.

This provision simply restates the language already included in 62-303. Therefore, this provision was determined not to be a change to water quality standards.

Subsection 62-302.200(42)

The definition of "water quality standards" was revised and now states:

(42) (31) "Water quality standards" shall mean standards composed of designated present and future most beneficial uses (classification of waters), the numerical and narrative criteria, including Site Specific Alternative Criteria, applied to the specific water uses or classification, the Florida anti-degradation policy, and the moderating provisions, such as variances, mixing zone rule provisions, or exemptions, contained in this rule and in Chapter 62-4, adopted pursuant to Chapter 403, F.S.

The revisions clarify the State's provisions that are considered a "water quality standard," however, this provision does not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is then utilized to make an attainment decision to identify water quality limited segments nor does it establish a designated use.

Revisions to Rule 62-302.530

Rule 62-302.530 consists of a table of the water quality criteria that apply to Florida's surface waters. While no revisions were made to the table itself, the introductory paragraph to the table was revised to include the following sentence:

Numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530 (47)(b), F.A.C., shall be expressed as spatial averages and applied over a spatial area consistent with their derivation.

It is reasonable to expect that the extent of the time and location to which a criterion applies to a specific waterbody should be consistent with its derivation. By doing so, the State is ensuring that sampling is compatible with the procedures used to establish the criteria. Page 104 at Nutrient Criteria Technical Guidance Manual: Rivers and Streams. EPA-822-B-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. This provision clarifies that FDEP will apply the numeric nutrient criteria over an area consistent with derivation of those criteria.¹⁴ This provision is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

New Rule 62-302.531

FDEP's nutrient rule numerically interprets the State's narrative nutrient criterion, which provides that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Rule is organized in a hierarchical manner, representing FDEP preferred approaches to establishing numeric interpretations for its narrative criterion.

The first hierarchy in Florida's Rule provides that, where a site-specific nutrient analysis has been performed for any particular waterbody, that site specific analysis will be considered the applicable numeric interpretation of the narrative criterion for a particular waterbody.¹⁵ A site-specific analysis may be developed through a total maximum daily load (TMDL), site-specific alternative criterion (SSAC), water quality based effluent limitation (WQBEL), or other FDEP approved action that numerically interprets the narrative criterion. Hierarchy 1 also includes estuary-specific numeric interpretations of the narrative nutrient criterion established in Rule 62-302.532. Where a site-specific numeric interpretation is not available, the second hierarchy in Florida's Rule establishes numeric nutrient values based on quantifiable stressor-response relationships between nutrients and biological response. FDEP was able to develop such stressor-response relationships for lakes and springs and has established criteria based on those relationships in this rule. For Florida streams, FDEP determined that available scientific data and information were insufficient to establish accurate quantifiable stressor-response relationships. Therefore, for streams where there is no site-specific numeric interpretation available, the third hierarchy in Florida's rule establishes reference-based numeric nutrient thresholds. These thresholds, applied together with biological information, determine the applicable numeric interpretation of the narrative criteria that apply to streams. Both water chemistry and biological data, where available, are evaluated to determine whether a stream is attaining the nutrient criteria. Waters that are not addressed under any of the three hierarchies continue to be subject to Florida's narrative nutrient criteria.

¹⁴ The specific spatial areas that apply for each waterbody type are described further in the discussion of 62-302.531(7).

¹⁵ A site-specific numeric interpretation of the narrative will not be effective for CWA purposes until that interpretation is approved as a new or revised WQS by EPA, pursuant to section 303(c) of the CWA.

Due to the extensive nature of the new provisions promulgated in 62-302.531 (Numeric Interpretations of Narrative Nutrient Criteria), each subsection of the rule is set out below, followed by EPA's analysis and conclusions. As set out more fully below, the EPA has determined that Rule 62-302.531 is consistent with the requirements of the CWA.

Subsection 62-302.531(1)

The narrative water quality criteria for nutrients in paragraphs 62-302.530(47)(a) and (b), F.A.C., applies to all Class I, Class II, and Class III waters.

Florida's narrative water quality criteria for nutrients contain two components. 62-302.530(47)(a), which is applicable to all designated use classifications in Florida, requires nutrients to be limited as necessary to prevent violation of other state water quality criteria. 62-302.530(47)(b), which applies only to designated use classifications I, II, and III, prohibits nutrient concentrations from being altered so as to cause an imbalance of natural populations of aquatic flora or fauna. Subsection 62-302.531(1) restates that both provisions of the narrative nutrient criteria continue to apply to Class I, II, and III waters. This provision does not change the content of either 62-302.530(47)(a) or (b). It does not establish a level of protection related to the magnitude, duration, or frequency of Florida's nutrient criteria. Therefore, this provision is not a revised or new water quality standard as that term is used in CWA Section 303(c) or the regulations in 40 CFR Part 131, and thus the EPA is taking no action on it.

Subsection 62-302.531(2)

The narrative water quality criterion for nutrients in paragraph 62-302.530(47)(b), F.A.C., shall be numerically interpreted for both nutrients and nutrient response variables in a hierarchical manner as follows:

(a) Where a site specific numeric interpretation of the criterion in paragraph 62-302.530(47)(b), F.A.C., has been established by the Department, this numeric interpretation shall be the primary interpretation. If there are multiple interpretations of the narrative criterion for a waterbody, the most recent interpretation established by the Department shall apply. A list of the site specific numeric interpretations of paragraph 62-302.530(47)(b), F.A.C., may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

This subsection introduces the structure of the three different hierarchical levels that the State will use for numeric interpretation of its narrative nutrient criterion. The subsection describes which numeric interpretation is the applicable numeric interpretation where more than one exists for a particular waterbody. For CWA purposes, the EPA construes the site-specific numeric interpretations of the narrative set out in this subsection as site-specific alternative criteria for nutrients for a particular waterbody. While not addressed in this provision, pursuant to 40 CFR § 131.21(c), such site-specific numeric interpretations of the narrative are not effective for CWA purposes until the interpretation is approved as a new or revised WQS by the EPA, pursuant to section 303(c) of the CWA.

The use of a procedure and guidelines for translating a narrative criterion, as well as clarifying which site specific numeric interpretation is applicable to particular waterbodies, is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act. Each hierarchical level is discussed separately below.

Note that in the remainder of this document, references to Florida's narrative nutrient criterion refer to 62-302.530(47)(b), unless otherwise stated.

Subparagraph 62-302.531(2)(a)1.

The primary site specific interpretations are as follows:

- a. Total Maximum Daily Loads (TMDLs) adopted under Chapter 62-304, F.A.C., that interpret the narrative water quality criterion for nutrients in paragraph 62-302.530(47)(b), F.A.C., for one or more nutrients or nutrient response variables;
- b. Site specific alternative criteria (SSAC) for one or more nutrients or nutrient response variables as established under Rule 62-302.800, F.A.C.;
- c. Estuary-specific numeric interpretations of the narrative nutrient criterion established in Rule 62-302.532, F.A.C.; or
- d. Other site specific interpretations for one or more nutrients or nutrient response variables that are formally established by rule or final order by the Department, such as a Reasonable Assurance Demonstration pursuant to Rule 62-303.600, F.A.C., or Level II Water Quality Based Effluent Limitations (WQBEL) established pursuant to Rule 62-650.500, F.A.C. To be recognized as the applicable site specific numeric interpretation of the narrative nutrient criterion, the interpretation must establish the total allowable load or ambient concentration for at least one nutrient that results in attainment of the applicable nutrient response variable that represents achievement of the narrative nutrient criterion for the waterbody. A site specific interpretation is also allowable where there are documented adverse biological effects using one or more Biological Health Assessments, if information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition indicate there are no imbalances in flora and a stressor identification study demonstrates that the adverse biological effects are not due to nutrients.

Subparagraph 62-302.531(2)(a)2.

For the primary site specific interpretations in subparagraph 62-302.531(2)(a)1., F.A.C., the notice of rulemaking or other public notice shall state that the Department is establishing a site specific interpretation for the receiving waterbody, and offer an opportunity for a public meeting and public comment.

Subparagraph 62-302.531(2)(a)1 establishes what FDEP expects to be the primary site-specific numeric interpretations of the narrative nutrient criteria under FDEP's nutrient rule: TMDLs, SSAC, estuary criteria established in 62-302.532, or other rules or orders formally established by the State. Additionally, 62-302.531(2)(a)1.d provides that for site-specific criteria to be established based on "other site specific interpretations," the interpretation must establish a total allowable load or ambient concentration for at least one nutrient that results in the attainment of the applicable response variable that represents attainment of the narrative nutrient criterion. Furthermore, a site-specific criterion does not need to address both causal variables or both causal and response variables in order to establish a "site-specific interpretation." However, consistent with FDEP's expectation outlined on page 2 of FDEP's Nutrient Standards Implementation Document, EPA expects that the unaddressed variable(s) will be covered by the criteria outlined in subsections 62-302.531(2) or (3). Lastly, 62-302.531(2)(a)1.d also states that site-specific criteria for nutrients may be established for waters that have failed the

respective biological health assessments, if there is no floral impairment and the applicant demonstrates, through a stressor identification study, that the observed biological impairment is not due to excess nutrients. This situation would most likely occur with faunal impairments (as indicated by SCI, LVI or Shannon-Weaver) are due to hydrologic modifications or other non-nutrient causes. The EPA understands that a Type I or II SSAC would be developed in this situation.

Because the purpose of this provision is to establish site-specific water quality criteria, for those rules or orders which are not already subject to a WQS administrative process, the State's provision at subparagraph 62-302.531(2)(a)2 makes it clear that notice of these orders and rules are subject to public notice, meeting, and comment procedures.

FDEP's approach is consistent with 40 CFR part 131, including 131.11(b)(1)(ii), which allows adoption of water quality criteria by states that "reflect site-specific conditions," and is approved by the EPA pursuant to section 303(c) of the Act. The procedures laid out in this provision are consistent with 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act. While not addressed in Subparagraph 62-302.531(2)(a)1 or 2, pursuant to 40 CFR § 131.21(c), a site-specific numeric interpretation of the narrative will not be effective for CWA purposes until that numeric interpretation is approved as a new or revised WQS by the EPA, pursuant to section 303(c) of the CWA. The TMDLs that the State intended to be reviewed and approved or disapproved by the EPA were provided separately, and will be addressed under separate cover.

Paragraph 62-302.531(2)(b)

If site specific numeric interpretations, as described in paragraph 62-302.531(2)(a), F.A.C., above, have not been established for a waterbody, but there is an established, quantifiable cause-and-effect relationship between one or more nutrients and nutrient response variables linked to a value that protects against an imbalance in the natural populations of the aquatic flora or fauna, then the numeric values for the nutrients or nutrient response variables, set forth in this paragraph (2)(b), shall be the applicable interpretations. Absent a numeric interpretation as established in paragraph 62-302.531(2)(a), F.A.C., site specific numeric interpretations are established as follows:

Paragraph 62-302.531(2)(b) establishes the hierarchical process for the application of water quality criteria for nutrients for lakes (in subparagraph 1.) and spring vents (in subparagraph 2.) as site-specific numeric interpretations of paragraph 62-302.530(47)(b). This paragraph provides that for lakes and springs, in the absence of primary site-specific interpretation for any particular waterbody, the numeric values established in subparagraphs 1 and 2 shall be the applicable interpretation of the narrative nutrient criterion. FDEP states that these values are based upon a "quantifiable cause-and-effect relationship between one or more nutrients and nutrient response variables linked to a value that protects against an imbalance in the natural populations of the aquatic flora or fauna."

The State hierarchical process is based on the State's determination that a site-specific interpretation of the narrative nutrient criterion is preferable in cases where information for a water body justifies the use of a criterion that is different from the criteria listed in subparagraph 1 and 2. FDEP's approach is consistent with 40 CFR part 131, including 131.11(b)(1)(ii), which allows adoption of water quality criteria by states that "reflect site-specific conditions," and is approved by the EPA pursuant to section 303(c) of the Act.

Numeric Nutrient Criteria for Lakes

Subparagraph 62-302.531(2)(b)1.

For lakes, the applicable numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., for chlorophyll *a* are shown in the table below. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability of chlorophyll *a* data and the concentrations of nutrients and chlorophyll *a* in the lake, as described below. The applicable numeric interpretations for TN, TP, and chlorophyll *a* shall not be exceeded more than once in any consecutive three year period.

This provision provides that the numeric interpretations for TN and TP for a lake will vary on an annual basis, according to the details of clause 1.a. This subparagraph also establishes the allowable frequency of exceedences of the water quality criteria for chlorophyll *a*, TN, and TP for lakes (which are listed in the table in clause 62-302.531(2)(b)1.b.) as no more than once in any consecutive three-year period. (The EPA's conclusion regarding this provision and the magnitude, frequency and duration of the State's numeric criteria for chlorophyll *a*, TN, and TP in the table are addressed in the EPA's review of 62-302.531(2)(b)1.b.)

Clause 62-302.531(2)(b)1.a.

If there are sufficient data to calculate the annual geometric mean chlorophyll *a* and the mean does not exceed the chlorophyll *a* value for the lake type in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of lake TN and TP samples, subject to the minimum and maximum limits in the table below. However, for lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 0.49 mg/L TP streams threshold for the region; or

Clause 62-302.531(2)(b)1.b.

If there are insufficient data to calculate the annual geometric mean chlorophyll *a* for a given year or the annual geometric mean chlorophyll *a* exceeds the values in the table below for the lake type, then the applicable numeric interpretations for TN and TP shall be the minimum values in the table below.

<u>Long Term Geometric Mean Lake Color and Alkalinity</u>	<u>Annual Geometric Mean Chlorophyll <i>a</i></u>	<u>Minimum calculated numeric interpretation</u>		<u>Maximum calculated numeric interpretation</u>	
		<u>Annual Geometric Mean Total Phosphorus</u>	<u>Annual Geometric Mean Total Nitrogen</u>	<u>Annual Geometric Mean Total Phosphorus</u>	<u>Annual Geometric Mean Total Nitrogen</u>
<u>> 40 Platinum Cobalt Units</u>	<u>20 µg/L</u>	<u>0.05 mg/L</u>	<u>1.27 mg/L</u>	<u>0.16 mg/L¹</u>	<u>2.23 mg/L</u>
<u>≤ 40 Platinum Cobalt Units and > 20 mg/L</u>	<u>20 µg/L</u>	<u>0.03 mg/L</u>	<u>1.05 mg/L</u>	<u>0.09 mg/L</u>	<u>1.91 mg/L</u>

<u>CaCO₃</u>					
<u>< 40 Platinum</u>					
<u>Cobalt Units</u>	<u>6 µg/L</u>	<u>0.01 mg/L</u>	<u>0.51 mg/L</u>	<u>0.03 mg/L</u>	<u>0.93 mg/L</u>
<u>and ≤ 20 mg/L</u>					
<u>CaCO₃</u>					

¹ For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 0.49 mg/L TP streams threshold for the region.

Clauses 1.a. and b. of paragraph 62-302.531(2)(b) establish the process for calculating a lake's "applicable [annual] interpretations" of the narrative nutrient criterion for TN and TP. Clause 1.b. also contains a table that establishes numeric values for annual geometric mean chlorophyll *a*, TP, and TN. The numeric values established through this subparagraph serve the purposes of nutrient water quality criteria for TN and TP, in addition to the chlorophyll *a* criteria. Other than the criteria for TP for lakes with color levels greater than 40 platinum cobalt units (PCU) in the West Central Nutrient Watershed Region (which are discussed below), the criteria adopted by the State in the table in clause 1.b are identical to the magnitude, frequency, and duration of the nutrient criteria promulgated by the EPA for Florida lakes in the EPA's December 2010 final rule.

Clauses 1.a and b. provide two methods for applying the numeric values for a given lake. Which method is used depends on whether available chlorophyll *a*, TN, and TP data are sufficient to meet the data requirements of 62-302.531(6), which requires at least four temporally-independent samples per year with "at least one sample collected between May 1 and September 30 and at least one sample collected during the other months of the calendar year" in order to calculate an annual geometric mean. The clauses also specify an alternate maximum calculated numeric TP interpretation for lakes in the West Central Watershed Region of the State with ambient color levels that exceed 40 platinum color units (PCU).

Clause 1.a establishes a process to apply the lake numeric values for TN and TP where the calculated annual geometric mean for chlorophyll *a* in a particular lake does not exceed the chlorophyll *a* value for that lake type in the table set out in clause 1.b. In that case, the TN and TP values for the lake are the annual geometric means of lake TN and TP samples, subject to the minimum and maximum values set out in the table. This process is followed for each year for which sufficient chlorophyll *a*, TN, and TP data are available. Where there is insufficient data to establish the chlorophyll *a* annual geometric mean or where that annual geometric mean exceeds the values set out in the table, clause 1.b provides that the numeric interpretations of the narrative nutrient criterion for TN and TP are the minimum values set out in the table.

On page 4 of FDEP's Nutrient Standards Implementation Document, Florida explains the State's implementation of this provision as follows:

If there are insufficient data to calculate the annual geometric mean chlorophyll *a* for a given year or the annual geometric mean chlorophyll *a* exceeds the values in Table 1 for the lake type, then the applicable numeric interpretations for TN and TP are the minimum values in the table. If there are sufficient data to calculate the annual geometric mean chlorophyll *a* and the mean does not exceed the chlorophyll *a* value for the lake type in Table 1, then the TN and TP numeric interpretations for that calendar year are the annual geometric means of ambient TN and TP samples for that lake, subject to the minimum and maximum TN and TP limits in the table.

If a lake is influenced by an upstream NPDES discharger, the Water Quality-Based Effluent Limitation (WQBEL) evaluation for that discharge would determine the specific TN and TP levels (again subject to the upper nutrient values for TN and TP) that would maintain the appropriate chlorophyll a target for the lake (6 or 20 µg/L) during all years, including years representing critical conditions. This evaluation would involve water quality modeling set to achieve a “never to exceed” chlorophyll target scenario. DEP evaluated the inter-annual variability in lake chlorophyll a levels and found that inter-annual standard deviation (natural log-transformed) typically ranges from 0.305 to 0.533. Given this level of variability, the long-term geometric chlorophyll a concentration in a colored or alkaline clear lake would need to be between 12.8 and 15.5 µg/L to be consistently found in compliance with the chlorophyll a standard of 20 µg/L. Consequently, the numeric nutrient permit limits for a point source discharger that influences a downstream lake would need to be adjusted to ensure attainment of chlorophyll a targets in this lower range during all years, with the precise permit limits being dependent upon site specific factors. If this demonstration of attainment cannot be made, the discharger could pursue other options, which include effluent nutrient reductions, discharge re-location (e.g., land application), or a Site Specific Alternative Criterion (establish alternate chlorophyll and nutrient targets that are fully protective of designated uses).

Based on the State’s explanation of this process, the development of nutrient controls will be based on meeting the appropriate nutrient criteria for all years, including the “critical” year or years, based on review of available data. The State provided further details of the WQBEL process on page 45 and 46 of the Nutrient Standards Implementation Document:

For lakes, the WQBEL may be derived to ensure that the discharge does not cause or contribute to exceedances of the numeric interpretation for the waterbody segment, which is expressed as a lake average. As stated previously, Florida’s wastewater permitting process puts the burden on the applicant to provide all of the necessary documentation for permit issuance, including demonstrating that their discharge will not cause violations of the water quality standards applicable to the lake. Depending on the circumstances of the lake, either a Level I or Level II WQBEL is established that implements this numeric interpretation of the narrative criteria. This is accomplished as follows:

- If the discharge can meet the applicable numeric interpretation, a Level I WQBEL is calculated to ensure the discharge does not exceed the Total Nitrogen and Total Phosphorus values contained in sub-subparagraph 62-302.531(2)(b)1.a., F.A.C.; or
- For existing discharges, a Level I WQBEL can be established at permitted nutrient loads if the receiving lake attains the numeric interpretation of the narrative expressed at sub-subparagraph 62-302.531(2)(b)1.a., F.A.C.; or
- For new or expanded discharges to a lake that attains the applicable criteria, a Level II WQBEL must be established that ensures the lake will continue to attain the numeric interpretation of the narrative; or
- If the lake does not attain the baseline TN or TP values in sub-subparagraph 62-302.531(2)(b)1.a., F.A.C., but attains the applicable chlorophyll a value in sub-subparagraph 62-302.531(2)(b)1.a., F.A.C., a Level II WQBEL must ensure attainment of the applicable chlorophyll a value in all years. The Level II WQBEL must also ensure that ambient lake nutrient conditions do not exceed the upper end of the range Total Nitrogen and Total

Phosphorus limits in sub-subparagraph 62-302.531(2)(b)1.b., F.A.C.

The EPA's approach for lakes in the December 2010 final rule is similar to the approach used by the State to derive the nutrient criteria set out in the table in clause 1.b, including similar data sufficiency requirements.¹⁶ Both the EPA's and the State's approach require at least four samples in the calculation of an annual geometric mean, with at least one measurement of TN, TP, or chlorophyll *a* between May and September. The EPA's approach allowed a one-time modification of a lake's TN or TP criterion to a value in the same range of values as adopted by the State.¹⁷ As described above, the State's provision allows for annual calculation of TN and TP criteria for an individual lake where the lake has been demonstrated to comply with its chlorophyll *a* criterion for a given year.

Under the State's approach, for years where the calculated annual geometric mean chlorophyll *a* exceeds the applicable criteria in the table in clause 1.b or the data sufficiency requirements for chlorophyll *a* are not met, the lake TN and TP criterion for that given year cannot be greater than the minimum numeric value in the table, which is the same as the lake criteria establish in the EPA's December 2010 final rule. Therefore, although this provision of Florida's Rule allows the lake criteria to vary on an annual basis, under certain circumstances, the State's approach achieves the same level of protection as the EPA's approach in the December 2010 final rule.

The EPA's federally promulgated criteria for Florida lakes reflect the "latest scientific knowledge...on the kind and extent of all identifiable effects on health and welfare...which may be expected from the presence" of nutrients in Florida's lakes. CWA section 304(a)(1). Based on the EPA's review, the criteria adopted by the State at 62-302.531(2)(b)1, 62-302.531(2)(b)1.a, and 62-302.531(2)(b)1.b provide the same level of protection as the EPA's federally promulgated criteria, and therefore are consistent with the requirements of 40 CFR part 131, including 131.11(b), and are approved by the EPA pursuant to section 303(c) of the Act.

After review of TP, TN, and chlorophyll *a* data in the West Central Region, FDEP concluded that the relationship between TP and chlorophyll *a* in West Central colored lakes was "extremely weak ... suggesting that other factors (e.g., nitrogen-limitation, residence time) greatly confound the influence of TP on algal response." FDEP Freshwater TSD, p. 187. The State evaluated only data from the West Central Region lakes in Figure 10-15 of the Freshwater TSD and determined that these data show that a wide range of chlorophyll *a* levels in these lakes occurs over a relatively small range of TP concentrations, and that very little variation in the chlorophyll *a* measurements were related to ambient TP concentrations. Based on a review of these data, Florida concluded that "(t)he lack of a strong predictive relationship demonstrates that little would be gained, in terms of within lake designated use protection, by controlling TP in colored West Central NWR [lakes]." FDEP Freshwater TSD, p. 188-189.

¹⁶ EPA's December 2010 final rule includes the following data requirements for lakes: "Sufficient data include at least four measurements per year, with at least one measurement between May and September and one measurement between October and April each year." Federal Register Vol. 75, No. 233, Page 75806.

¹⁷ See 40 CFR section 131.43(e).

However, in light of the need to ensure downstream protection from elevated levels of TP, the State chose to adopt an upper TP threshold for West Central colored lakes at the same criterion value adopted for the regional TP threshold for freshwaters streams, i.e., 0.49 mg/L. In FDEP's Q&A Document, the State summarized its decision process, as follows:

The University of Florida requested that we assess the effectiveness of lake regions in explaining the chlorophyll response to nutrients for various parts of the state. DEP conducted a residuals analysis and found that the statewide regression between TP and chlorophyll was inaccurate for lakes in the West Central, high phosphorus region of the state ... After more closely examining the lakes in this geologic area (which was best explained by aggregating the lakes to match the West Central Stream Nutrient region), we re-ran the TP versus chlorophyll regression and applied an upper prediction interval. The upper prediction interval for the lakes TP would have actually been higher than the streams criteria, so we capped the TP value at the TP value for streams in the region to ensure downstream protection.

Based on the EPA's review, FDEP's development of the maximum TP threshold for West Central colored lakes is scientifically defensible and, therefore, is consistent with the requirements of 40 CFR part 131, including 131.11(b), and is approved by the EPA pursuant to section 303(c) of the Act.

Clause 62-302.531(2)(b)1.c.

c. For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 micromhos/cm used to estimate the 20 mg/L CaCO₃ alkalinity concentration until such time that alkalinity data are available.

In addition to including 20 mg/L CaCO₃ as a threshold for establishing subcategories of Florida lakes (which was also the EPA's approach in the December 2010 final rule), Florida included specific conductance as an alternate parameter that may be used to classify lakes in the absence of sufficient alkalinity data. The Technical Advisory Committee (TAC) for the State's development of numeric nutrient criteria discussed the use of alkalinity and specific conductance cut-offs for nutrient criteria for clear lakes. As stated on page 171 of the Freshwater TSD, "[t]he TAC suggested that different nutrient and chlorophyll a expectations should be established for high alkalinity (>20 mg CaCO₃/L or specific conductance >100 µmhos/cm) clear lakes because of the naturally higher, aquifer-derived phosphorus levels this subset of clear lakes." This recommendation was evaluated by FDEP in order to determine whether the relationship between nutrients and chlorophyll a was different for clear lakes with specific conductance values above and below 100 µmhos/cm such that 100 µmhos/cm should serve as an alternate threshold for sub-categorizing Florida's lakes. FDEP determined that the 100 µmhos/cm cut-off for specific conductance would "capture lakes that receive input from calcareous aquifer sources, which naturally contain higher levels of phosphorus than do lakes that receive most of their water from (low conductivity) rainfall," and would, therefore, "capture the differences between lakes receiving groundwater input from calcareous aquifer sources (higher alkalinity), which contain natural higher levels of phosphorus, from lakes that receive most of their water from (low alkalinity) rainfall." Freshwater TSD, page 177.

Based on the EPA's review of the State's rationale, the State's decision to provide an option to use specific conductance data in the absence of alkalinity data achieves a similar result in determining the applicability of nutrient criteria for these lakes and is, for the reasons above and in FDEP's Freshwater TSD, a scientifically defensible approach for criteria development and implementation. Therefore, this provision is consistent with the requirements of 40 CFR part 131, including 131.11(b), and is approved by the EPA pursuant to section 303(c) of the Act.

The EPA notes that this provision also specifies that color, alkalinity, and specific conductance assessments for these lakes must be "based on a minimum of ten data points over at least three years with at least one data point in each year." This part of clause 62-302.531(2)(b)1.c addresses data reliability, but does not establish or revise the magnitude, duration, or frequency of the chlorophyll *a* criteria established by the State, and thus is not a new or revised WQS for the purposes of the EPA's CWA's Section 303(c) review.

Numeric Nutrient Criteria for Springs

Subparagraph 62-302.531(2)(b)2.

For spring vents, the applicable numeric interpretation of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., is 0.35 mg/L of nitrate-nitrite ($\text{NO}_3 + \text{NO}_2$) as an annual geometric mean, not to be exceeded more than once in any three calendar year period.

The EPA's December 2010 final rule, in part, established a numeric nutrient criterion for Florida's springs in Class I and Class III freshwaters to assure the attainment of the State's applicable water quality designated uses.

The magnitude, frequency and duration of the water quality criterion for nitrate-nitrite ($\text{NO}_3 + \text{NO}_2$) adopted by the State for freshwater spring vents in subparagraph 62-302.531(2)(b)2 are identical to the criterion published in the EPA's December 2010 final rule. Both the State's and the EPA's numeric criteria for springs are based on interpretation of Florida's nutrient narrative provision at 62-302.530(47)(b) for springs designated as Class I and Class III freshwaters.

EPA, in the preamble to the final EPA Inland Rule, stated:

EPA proposed criteria for nitrate+nitrite because one of most significant factors causing adverse changes in spring ecosystems is the pollution of groundwater, principally from nitrate+nitrite, resulting from human activities, land use changes, cultural practices, and population growth. EPA's criterion was based on multiple lines of stressor-response evidence, including laboratory and field-based data. The results from these studies provided strong empirical evidence of a stressor-response relationship between nuisance algae and nitrate+nitrite and indicated specific concentrations above which undesirable growth of nuisance algal were likely to occur. EPA concluded that the data available provided a sound scientific rationale for the nitrate+nitrite concentration of 0.35 mg/L. This value is intended to prevent imbalanced or excess nuisance algal growth and is supportive of a balanced natural population of aquatic flora and fauna in Florida springs.

In Chapter 3 of the Agency's Technical Support Document for U.S. EPA's Final Rule for Numeric Criteria for Nitrogen/Phosphorus Pollution in Florida's Inland Surface Fresh Waters (TSD), EPA stated:

Derivation of EPA's Numeric Nutrient Criteria for Springs explains that nitrate-nitrogen ($\text{NO}_3 + \text{NO}_2$) concentrations are the pre-eminent and driving factor linked to adverse changes in Florida spring ecosystems. While there are a variety of sources of nitrogen in springs, there appears to be no geologic source of nitrate+nitrite. The nitrate+nitrite concentrations are principally anthropogenic in nature, i.e. linked to population growth and associated with urban and agricultural activities. The nitrate+nitrite concentrations then seep into groundwater and emerge at spring vents. Excess algal and plant growth results in adverse effects in springs including reduced habitat and food sources for native wildlife and reduced beneficial submerged aquatic vegetation. EPA found no evidence to link levels of phosphorus to the adverse effects observed in Florida's springs. EPA also found no evidence of excess planktonic algal growth, as indicated by water column algal or phytoplankton biomass (chlorophyll *a*) in Florida springs. This observance is likely due to short residence times (high flushing/flow rates) of water at spring discharges resulting in low phytoplankton chlorophyll *a*. Florida's current transparency criterion protects clarity in Florida's springs in order to maintain the low sediment, dissolved organic and water column algal biomass levels.

EPA established a spring nitrate+nitrite criterion duration considering the variable temporal responses of algae to nitrate-nitrite and concluded that the spring criterion should not be exceeded more than once as an annual geometric mean over a three year period. EPA found in its review of springs data and information that nitrate concentrations can be variable from month to month, and this intra-annual variability was not necessarily associated with impairment of the designated use. Therefore, to account for intra-annual variability, EPA chose to express the nitrate+nitrite criterion for springs on an annual basis. This approach is protective of cumulative effects in shorter periods of time than three years.

The EPA's federally promulgated criterion for Florida springs reflects the "latest scientific knowledge...on the kind and extent of all identifiable effects on health and welfare...which may be expected from the presence" of nutrients in Florida's springs. CWA section 304(a)(1). Based on the EPA's review, the criterion for spring vents adopted by the State provide the same level of protection as the EPA's federally promulgated criterion for springs in Florida, and therefore is consistent with the requirements of 40 CFR part 131, including 131.11(b) and the CWA, and are approved by the EPA pursuant to section 303(c) of the Act.

Numeric Nutrient Criteria for Streams

Paragraph 62-302.531(2)(c)

For streams, if a site specific interpretation pursuant to paragraph 62-302.531(2)(a) or (2)(b), F.A.C., has not been established, biological information shall be used to interpret the narrative nutrient criterion in combination with Nutrient Thresholds. The narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., shall be interpreted as being achieved in a stream segment where information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition indicates there are no imbalances in flora or fauna, and either:

1. the average score of at least two temporally independent SCIs performed at representative locations and times is 40 or higher, with neither of the two most recent SCI scores less than 35, or
2. the nutrient thresholds set forth in the table below are achieved.

<u>Nutrient Watershed Region</u>	<u>Total Phosphorus Nutrient Threshold¹</u>	<u>Total Nitrogen Nutrient Threshold¹</u>
<u>Panhandle West</u>	<u>0.06 mg/L</u>	<u>0.67 mg/L</u>
<u>Panhandle East</u>	<u>0.18 mg/L</u>	<u>1.03 mg/L</u>
<u>North Central</u>	<u>0.30 mg/L</u>	<u>1.87 mg/L</u>
<u>Peninsular</u>	<u>0.12 mg/L</u>	<u>1.54 mg/L</u>
<u>West Central</u>	<u>0.49 mg/L</u>	<u>1.65 mg/L</u>
<u>South Florida</u>	<u>No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.</u>	<u>No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.</u>

¹ These values are annual geometric mean concentrations not to be exceeded more than once in any three calendar year period.

For streams, paragraph 62-302.531(2)(c) applies where neither a primary hierarchy level site-specific numeric interpretation nor a second hierarchy level quantifiable cause-and-effect relationship has been established for a particular waterbody. The State has elected to use a criterion comprised of a two-part method to interpret its narrative nutrient criterion for such streams. The criterion includes a combination of biological information and numeric thresholds for TN and TP. The State will consider whether aquatic flora have been adversely affected by nutrients (or some other stressor), based on a list of floral response indicators, together with either a fauna biological health assessment, in this case SCI, or the nutrient threshold concentrations set out in subparagraph 62-302.531(2)(c)2.

For the first part of the two-part method to interpret the narrative nutrient criterion, the State has determined that certain biological responses (demonstrated by undesirable chlorophyll *a* levels, the presence of excessive algal mats or blooms, nuisance macrophyte growth, and undesirable changes in algal species composition) are each independent indications of imbalanced flora. If none of these responses has occurred in a particular waterbody, then the State believes there is no indication of imbalanced flora in that waterbody. For the second part of the two-part method, either an average SCI score of 40 or greater¹⁸ (indicating balanced fauna) or concentrations of TP and TN equal to or less than those established in 62-302.531(2)(c)2, is required to conclude that the waterbody's Class III designated use is being supported.

Before discussing the State's approach in further detail, it is worth noting what the EPA's review addresses. Florida's biological indicators were established to coincide with a certain level of protection

¹⁸ The criterion also requires that neither of two most recent SCI scores be less than 35.

related to a specific recreation and aquatic life use support goal. That use goal is established by the State in their existing water quality standards as the Class III recreation and aquatic life use of “recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife.” To protect this use from nutrient pollution, nutrients must not cause “an imbalance in natural populations of aquatic flora or fauna” pursuant to paragraph 62-302.530(47)(b). The State selected floral and faunal thresholds utilizing the State’s scientific knowledge and best professional judgment to incorporate existing data and information into thresholds that reflect the selected level of use protection associated with the State’s policy goal. Other states have made different policy decisions, some of which may reflect more or less conservative goals to reflect the level of protection desired in their respective waters.¹⁹ Furthermore, some other states have chosen to utilize biological and/or nutrient information in a different combination, or even in an entirely separate format, than that adopted by Florida. The State of Florida has developed a suite of floral metrics that, taken as a whole, are intended to adequately consider the variability in biological responses of Florida streams covered under the Rules to nutrient overenrichment.²⁰ The State’s approach is an interpretation of the narrative nutrient criterion with a significant emphasis on biological indicators that, when all are met, are intended to indicate use attainment regardless of the level of nutrients (TN and TP) in the waterbody.²¹ Although a definitive threshold relationship between biological responses and nutrient concentrations in Florida’s streams is difficult to discern at this time, the EPA’s review of this provision focuses on whether the individual components of this integrated, multimetric provision are protective of the waterbody’s uses and are consistent with the CWA and regulatory requirements for criteria development. Florida’s narrative includes a reference to an imbalance of flora and fauna, which FDEP has chosen to interpret through this numeric interpretation of the narrative by focusing on a use support test designed to assess whether the waterbody’s flora and fauna remain in balance considering the level of nutrients.

The State has chosen to adopt the format set out at 62-302.531(2)(c), which includes multiple biological components, based on its conclusion that application of the numeric threshold concentrations alone may not be appropriate for every Florida waterbody.²² Instead, where a site-specific interpretation has not

¹⁹ EPA also notes that FDEP has identified SCI thresholds that protect higher levels of biological condition, although they were not adopted as part of the current rulemaking effort.

²⁰ As outlined on pages 10-11 in FDEP’s implementation document, neither FDEP nor EPA was able to identify a “floral health/impairment threshold.Until these Biocriteria are developed, the Department’s approach is to compare floral measures from streams to Benchmark (reference) stream floral data to determine whether a stream has a balanced floral community...These assessments were chosen because they: represent the entire range of potential floral response to nutrients...; may routinely be conducted by Department staff...; and comprise the most advanced floral assessment tools currently available for the State of Florida.”

²¹ The nutrient thresholds, in the absence of floral and faunal information, will be used in attainment decisions. See discussion of 62-303.390.

²² Section 6.7 of FDEP’s Freshwater TSD generally concludes that the results of the analyses to determine the effects of anthropogenic nutrient increases on the biological communities demonstrate a statistically significant response to nutrient enrichment, that although weakly related statistically, do support the values derived using the Nutrient Benchmark Approach. “Both the analysis of the [RPS] and the analysis of the second change point in the stream periphyton response to nutrients indicate that the biological response to nutrient enrichment will generally occur at levels higher than the values generated using the Benchmark Distribution Approach.”

been developed for a particular stream, the third hierarchy applies the reference approach-based stream thresholds in conjunction with determining whether or not the biological health is being supported at that place and time. Absent a positive showing of floral and faunal health, waters that exceed the numeric thresholds are not attaining the narrative numeric criterion and will be deemed to have an impaired use pursuant to CWA section 303(d). However, where both flora and fauna have been confirmed to be healthy, waters may be in attainment of the narrative criterion when TN and/or TP levels are above the numeric thresholds. In section 2.7.1 of the document titled *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (dated October 24, 2011) (SCI Primer), Florida states that “if data show that biological health is fully supported in an aquatic system (no adverse responses consistent with the ecological model), it may be concluded that the associated nutrient regime is inherently protective of the waterbody, and the narrative nutrient criterion is achieved.” Where a stream surpasses the TN and/or TP thresholds and there is insufficient biological information to fully demonstrate that flora or fauna are balanced, the stream is not attaining the narrative nutrient criterion and will be included on the Study List (i.e., the water will be identified as having an impaired use pursuant to CWA section 303(d)). This process is more fully described later within the 62-303 sections of this document.

Since adverse effects of nutrient over-enrichment primarily manifest themselves through excessive algae and plant production, FDEP’s criteria for streams includes information such as floral response variables to identify impaired streams. This biological information augments the reference-based nutrient thresholds. Paragraph 62-302.531(2)(c) addresses four measures of algal response to nutrients: chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition. Paragraph 62-302.531(2)(c) also addresses the SCI and how SCI scores are to be considered in relation to the narrative nutrient criterion. How these measures are to be assessed under FDEP’s nutrient rule is described in additional detail within Section 2.7 of the SCI Primer and within FDEP’s Nutrient Standards Implementation Document.

The EPA determined that only certain portions of the SCI Primer document, specifically a subset of the text in Section 2.7, were new or revised water quality standards in the form of constituent thresholds within an integrated multimetric standard for nutrients in streams. These provisions provide thresholds for considering each of the biological components contained in FDEP’s integrated multimetric criterion for nutrients in streams. The discussion of paragraph 62-302.531(2)(c), below, addresses each provision of that paragraph together with the relevant sections of the SCI Primer. The relevant sections of the SCI primer address the “floral” response variables and the SCI threshold. Consideration of each of these components was necessary for the EPA to determine whether the adopted provision is protective of the designated uses of Florida streams. Paragraph 62-302.531(2)(c) must be read together with the SCI Primer and FDEP’s Nutrient Standards Implementation Document, which clarify how these biological components will function with the TN and TP thresholds as an integrated water quality criterion.

Paragraph 62-302.531(2)(c) clearly indicates that all floral metrics must be met to demonstrate attainment of the narrative nutrient criterion. Failure of a single individual floral component leads to the conclusion that the use is not being attained for a particular waterbody. In addition to all of the floral metrics, a stream must also meet either the TN and TP thresholds or the faunal metric, the SCI threshold, to demonstrate attainment of the narrative nutrient criterion.

On page 16 of FDEP’s Nutrient Standards Implementation Document, the State states that “if any one of these floral measures indicates an imbalance, then the stream does not attain the NNC”. This establishes

that a water body must satisfy each of the metrics in Table 3, which correspond to the same values found in the SCI primer, in order to satisfy FDEP's narrative. These are the same floral metrics established in the SCI Primer, which was incorporated by reference in FDEP's rule. Further, a decision matrix, included on page 23 of FDEP's Nutrient Standards Implementation Document, clarifies the State's interpretation of how each floral metric will be used, providing that "any one floral measure not attained" indicates the criterion at 62-302.531(2)(c) is not attained. In addition, according to page 9 of FDEP's Nutrient Standards Implementation Document, if floral data are unavailable for a stream and either the TN or TP thresholds are exceeded, then the criterion is not met and the stream is placed on the Study List, which is included as part of the State's 303(d) list of impaired waters.

The first step in determining whether the narrative nutrient criterion is being attained in a stream without a site-specific interpretation of the narrative is determining whether the four identified floral measures indicate the stream has balanced flora. Each of the identified floral measures, as further described in the SCI Primer and the Nutrient Standards Implementation Document, is discussed below.

Floral Response Variables

Presence of algal mats

SCI Primer Section 2.7.3 (page 22)

[I]f a stream exhibits RPS rank 4-6 percent coverage between the mean percent observed at these minimally disturbed and healthy sites (6-8%) and the associated 90th percentile values (25-32%), this would be considered an indication of no imbalance of flora.

Section 2.7.3 of the SCI Primer discusses the Rapid Periphyton Survey (RPS) as a quantitative measurement associated with an "abundance of nuisance or problematic algal growth" that will be used by the State to determine when a given level of algal response indicates a floral imbalance. The EPA reviewed the information in Sections 2.7.3, including the specific threshold for "algal mats" incorporated by reference, and the additional detail provided by the State in FDEP's Nutrient Standards Implementation Document, to determine how the State will interpret what indicates an imbalance in flora, relative to the "algal mats" component of 62-302.531(2)(c).

Based on FDEP's experience observing periphyton growth at minimally disturbed nutrient benchmark sites, FDEP concluded on page 10 of the Nutrient Standards Implementation Document, that "no imbalance of flora" is demonstrated when "a stream exhibits RPS rank 4-6 percent coverage of 25% or less in both samples." The selection of 25% reflects the 90th percentile of percent coverage of algae at minimally disturbed streams used by Florida in its derivation of this threshold. Furthermore, on the same page, FDEP concluded "use of an RPS evidentiary threshold based on the 90th percentile of the EPA reference sites would be consistent with the manner in which the nutrient thresholds were derived." As discussed previously, one sample not meeting the threshold is sufficient to conclude the stream does not attain the narrative. Page 23 at FDEP's Nutrient Standards Implementation Document.

The quantitative factors regarding RPS coverage and changes in algal species composition provide information regarding the expectation of what is indicative of nutrient enrichment and the resulting imbalance that can occur. The 25% coverage value represents the State's effort to quantify the algal mats component of the stream provision at 62-302.531(2)(c). Considering the maximum allowable percentage coverage of the specified thickness of algal mats and the demonstration required to indicate

floral health provides information regarding the condition of nutrient enrichment and the resulting expectation of what indicates balance and imbalance. The State's decision that less than 25% coverage by algal mats demonstrates that algal mats don't represent imbalance, which was based on the 90th percentile of benchmark sites, and the corresponding requirement that this coverage be exhibited in two consecutive sampling events, represent reasonable conclusions regarding stream floral health related to "algal mats". It is appropriate to use the 90th percentile for the benchmark distribution because the least-disturbed sites identified in Florida that are used to derive the criteria more closely approximate minimally-impacted conditions. (See EPA's December 2010 final rule, fn 99, page 75776 and see pages 41-42, below, and citations at fn 33-38.) As a result, the EPA concludes that the "algal mats" component of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the specific provisions related to "algal mats" incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "algal mats" component of the integrated multimetric criterion in 62-302.531(2)(c), including the provisions identified in the SCI Primer that are associated with the algal mat component of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Nuisance macrophyte growth

SCI Primer Section 2.7.4 (page 23)

[I]f a stream exhibits a C of C score of >2.5 and a frequency of occurrence of FLEPCC exotics is <25% of the total plant occurrences, this would be considered an indication of no imbalance of flora.

Section 2.7.4 of the SCI Primer discusses the Linear Vegetation Survey (LVS) as a measurement associated with a "relative lack of nuisance macrophyte growth" that will be used by the State to determine when a given level of macrophyte growth is considered a nuisance, and therefore indicates a floral imbalance. The EPA reviewed the information in Section 2.7.4, including the specific thresholds for "nuisance macrophyte growth" incorporated by reference, and the additional detail provided by the State in FDEP's Nutrient Standards Implementation Document, to determine how the State will interpret what indicates an imbalance in flora, relative to the "nuisance macrophyte growth" component of 62-302.531(2)(c).

Based on FDEP's experience and analysis by expert botanists in a 2011 initiative²³, the State has concluded that a Coefficient of Conservatism (C of C) score of ≥ 2.5 and a Florida Exotic Pest Plant Council (FLEPPC) frequency of $\leq 25\%$ of the total plant occurrences indicates balanced flora. Page 13 of FDEP's Nutrient Standards Implementation Document summarizes FDEP's evaluation.²⁴

²³ Page 23 of the SCI Primer indicates that a list of C of C scores, FLEPCC taxa, and other vascular plant attributes relevant to the LVS, can be found in DEP SOP LVI 1000 Appendix LVI 1000-1. The 2011 initiative is referenced on page 23.

²⁴ Although the Primer document makes reference to 58 sites with 19 sites having sufficient plant growth, Appendix A-2 lists 41 sites. This discrepancy was addressed on page 28 of the Q&A Document. The 58 sites were part of "an earlier data set that included both sites that were part of EPA's reference stream list and sites that were determined to be healthy by passing the SCI. To be consistent with the EPA methodology used for establishing the actual numeric thresholds for TN and TP, DEP chose to include only the EPA reference sites with sufficient plant information (41 sites) when establishing the final guidance on the LVI, which are presented in Appendix A-2 of the Implementation document."

The Department evaluated LVS data from the EPA reference streams and found that if a site's average C of C score is greater than or equal to 2.5 (the 10th percentile of the distribution), the plant community composition may be considered to be part of the reference site distribution. Based on the Department's experience in minimally disturbed streams and the types of plants associated with C of C scores greater than or equal to 2.5, this threshold was determined to be reasonable and protective.

The Department also analyzed the frequency of occurrence of FLEPCC exotics in the EPA reference streams, and found that, due to the influence of a few streams at the 90th percentile, FLEPCC exotics made up approximately 40% of the total plant occurrences. Considering the somewhat limited number of reference streams with vascular plants [41 sites] and the variability in the data, the Department decided to set the FLEPCC threshold at the 80th percentile of the distribution. Therefore, if the frequency of occurrence of FLEPCC exotics at a site is less than or equal to 25% of the total plant occurrences (the 80th percentile of the distribution), the site may be considered to be part of the reference site distribution.

The quantitative factors regarding nuisance macrophyte levels, as interpreted using C of C scores and a specified frequency of exotic plant occurrence, provide information regarding the expectation of what is indicative of nutrient enrichment and the resulting imbalance that can occur. Furthermore, for the same reasons outlined in the "presence of algal mats" section, the incorporation of the requirement to have two LVS scores to indicate floral health is an important demonstration that elevated nutrient concentrations are not causing an imbalance in flora. The State's decisions that a C of C score greater than 2.5 and a FLEPCC frequency less than 25% demonstrates that the macrophyte growth present does not represent imbalance, which were based on the 10th and 80th percentiles of benchmark sites, respectively, and the corresponding requirement that this coverage be exhibited in two consecutive sampling events, represent reasonable conclusions regarding stream floral health related to "macrophyte growth." In situations where a lower score represents a less desirable condition, such as the case in a C of C score less than 2.5, the use of the 10th (which is comparable to the 90th percentile in other scenarios) has been considered to be consistent with guidance for considering the data associated with least-disturbed, healthy streams that are supporting designated uses, and that data is associated with a high level of confidence. See pages 40-41, below, and citations at fn 33-38. Similarly, due to less confidence in the data, it is reasonable to select a different percentile, the 80th percentile in the case of the FLEPCC threshold. As a result, the EPA concludes that the "nuisance macrophyte growth" component of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the specific thresholds for "nuisance macrophyte growth" incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "nuisance macrophyte growth" component of the integrated, multimetric criterion in 62-302.531(2)(c), including the provisions identified in the SCI Primer that are associated with the nuisance macrophyte component of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Algal blooms and Chlorophyll a levels

SCI Primer Section 2.7.5 (page 24)

An unacceptable phytoplankton bloom would consist of a situation where an algal species, whose noxious characteristics or presence in sufficient number, biomass, or areal extent may reasonably be expected to prevent, or unreasonably interfere with, the designated use of the waterbody.

*DEP evaluates the autecological information for the dominant bloom species, in conjunction with the associated chlorophyll *a* and the persistence of the bloom, as a line of evidence when assessing imbalances of flora.*

If a stream exhibits annual geometric mean chlorophyll concentrations between the mean observed at these minimally disturbed and healthy sites (2.0-2.1 µg/L) and the associated 90th percentile values (3.2-3.5 µg/L), this would be considered a clear indication of no imbalance of flora.

Section 2.7.5 of the SCI Primer discusses the qualitative and quantitative measures of algal blooms and chlorophyll *a* concentrations that will be used by the State to determine whether these measures indicate a floral imbalance. The EPA reviewed the information in Section 2.7.5, including the specific provisions for “algal blooms” and “chlorophyll *a* levels” incorporated by reference, and the additional detail provided by the State in the Nutrient Standards Implementation Document, to determine how the State will interpret what indicates an imbalance in flora relative to the “algal blooms” and “chlorophyll *a* levels” components of 62-302.531(2)(c).

For algal blooms, the State has provided a narrative statement to explain what conditions would be considered to be an “unacceptable phytoplankton bloom”. Consideration of the dominant bloom species and the persistence of the bloom complete the qualitative descriptions of algal bloom measures. Both of these considerations affect the interpretation of the “algal blooms” component of 62-302.531(2)(c).

The State also included quantitative measurements in Section 2.7.5 related to chlorophyll *a* concentrations to use when determining whether streams are attaining the narrative nutrient criterion and the associated integrated, multimetric criterion. In the same SCI Primer section, since the State determined that a definitive chlorophyll *a* criterion that “did, or did not, support aquatic life uses” could not be established, the State established upper and lower bounds for chlorophyll *a* concentrations that serve as the basis for attainment decisions, while waters exhibiting chlorophyll *a* concentrations between the upper and lower bound will be evaluated on a site specific basis.

The upper bound implements Florida’s existing “one-sided” impairment threshold for chlorophyll *a* in streams. See fn 25. The impairment threshold of 20 µg/L was approved by the EPA in 2008 as an upper boundary condition above which a water body is not meeting its applicable water quality standards (unless demonstrated otherwise) and is identified as impaired. Waters below the use impairment threshold, however, are not considered in attainment of the narrative criterion. Such waters are considered “unassessed” rather than “unimpaired”.²⁵

²⁵ “Determination Upon Review of Amended Florida Administrative Code Chapter 62-303, Identification of Impaired Surface Waters, Appendix B”, United States Environmental Protection Agency, February 19, 2008.

Page 24 of the SCI Primer establishes a lower bound, which represents chlorophyll a concentrations associated with levels commonly found in FDEP's benchmark streams, based on the existing data considered by the State. FDEP concluded that "if a stream exhibits annual geometric mean chlorophyll concentrations [less than 3.2 µg/L], this would be considered a clear indication of no imbalance of flora." Therefore, chlorophyll a concentrations less than 3.2 µg/L, based on the 90th percentile benchmark value, indicate balanced flora.

Where streams have chlorophyll a concentrations between the upper and lower bounds (i.e., 3.2 and 20 µg/L), the State requires a site-specific analysis to determine whether the stream is achieving the narrative nutrient criterion. Page 14 of FDEP's Nutrient Standards Implementation Document states that "the range in 'healthy' stream chlorophyll a values is due to a variety of site specific factors, such as system morphology, water residence time, and presence of lentic taxa [and] may indicate a healthy aquatic stream in a natural transition from a lotic to lentic system during the time period studied." Page 14 also indicates "[i]f a site has chlorophyll values within the 3.2 µg/L to 20 µg/L range, the assessment is inconclusive until the Department documents a decision regarding whether chlorophyll a conditions reflect [an] imbalance in flora or not. Therefore, where there is not a site-specific demonstration, the EPA expects that waters in the range between 3.2 and 20 µg/L would be included on the Study List (a component of the State's CWA section 303(d) list) for further evaluation, pursuant to section 62-303.390(2)(e). Further discussion regarding how FDEP will use chlorophyll a data in attainment decisions is set out in the discussions of 62-303. As described above, the EPA considers this method to be consistent with previous conclusions regarding the 20 µg/L chlorophyll a impairment threshold because the same expectation exists that the waters are considered "unassessed" when in the range between 3.2 µg/L to 20 µg/L.

Florida's rule at 62-302.531(2)(c) requires a demonstration that all four floral metrics have been met in order to determine that a stream is achieving the narrative nutrient criterion. Thus, the additional factors provided by SCI Primer Section 2.7 provide information regarding how FDEP will implement the chlorophyll a and algal blooms components of 62-302.531(2)(c). The State's selection of 3.2 µg/L, which was based on the 90th percentile of benchmark sites, represents a reasonable conclusion regarding stream floral health related to "chlorophyll a levels." It is appropriate to use the 90th percentile for the benchmark distribution because the least-disturbed sites identified in Florida that are used to derive the criteria more closely approximate minimally-impacted conditions. (See EPA's December 2010 final rule, fn 99, page 75776 and see analysis on pages 40-41 and citations at fn 33-38.) As a result, the EPA concludes that the "chlorophyll a levels" and "algal blooms" components of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the specific threshold and qualitative assessments for "chlorophyll a levels" and "algal blooms," respectively, incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "chlorophyll a levels" and "algal blooms" components of the integrated, multimetric criterion in 62-302.531(2)(c), including the provisions identified in the SCI Primer that are associated with the algal blooms component of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Changes in algal species composition

SCI Primer Section 2.7.3 (page 22)

[I]f the percentage of sampled points with a thickness rank of 4-6 is 20% or greater, the biologist collects a composite sample of the dominant groups of periphyton in the stream segment for lab identification of the dominant algal taxa. If autecological information is available for the dominant taxa, this is also qualitatively evaluated.

Section 2.7.3 of the SCI Primer and pages 11 through 12 of FDEP's Nutrient Standards Implementation Document discuss the methods for determining whether specific changes in algal species composition indicate a floral imbalance.²⁶ The EPA reviewed the information in these sections, including the specific provision for "changes in algal species composition" incorporated by reference in the SCI Primer, to determine how the State will determine an imbalance in flora, relative to the "changes in algal species composition" component of 62-302.531(2)(c).

As further clarified in FDEP's Nutrient Standards Implementation Document, the State has determined that there is no need to evaluate algal species composition when the RPS 4-6 coverage is less than 20%, since this lower level of coverage indicates no imbalance of flora due to algal presence. However, when the coverage is greater than 20%, the algal species composition will be evaluated. The State's Nutrient Standards Implementation Document indicates that the five most dominant taxa will be identified. Next, the autecological information will be analyzed, and significant changes in algal species composition will be evaluated using the references in Appendix B of FDEP's Nutrient Standards Implementation Document. Page 12 of FDEP's Nutrient Standards Implementation Document includes a decision key for algal species composition which includes the question "Do dominant taxa [where dominant species are those that individually constitute approximately 10% or more of the community] of algal community include taxa known to be nutrient enrichment indicators?" Answering the question affirmatively results in a conclusion that the nutrient standard at Rule 62-302.531(2)(c) is not achieved. In this way, FDEP assesses the environmental information associated with dominant algal taxa, using the scientific literature, to determine if the taxa are indicative of nutrient enriched/imbalanced conditions.

The quantitative factors regarding RPS coverage and changes in algal species composition provide information regarding the expectation of what is indicative of nutrient enrichment and the resulting imbalance that can occur. Thus the additional factors provided by SCI Primer Section 2.7 provide information regarding how FDEP will implement the changes in algal species composition component of 62-302.531(2)(c). The use of scientific literature that represents well accepted, peer reviewed expectations related to taxa that are indicative of different nutrient conditions represents a reasonable process for assessing changes in algal species composition. As a result, the EPA concludes that the "algal species composition" component of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the analysis associated "algal species composition" incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "algal species composition" component of the integrated, multimetric criterion in 62-302.531(2)(c), including the

²⁶ "Where the RPS 4-6 coverage is greater than 20%, an evaluation of the algal species composition (identifying the five most dominant taxa) is also conducted to provide additional information whether there is no imbalance of flora. Where RPS 4-6 coverage is <20%, there is no need to collect samples for algal species composition because the stream is clearly within the reference distribution, and therefore, the algal species composition is presumed to be acceptable. (Page 10 of FDEP's Nutrient Standards Implementation Document)

provisions identified in the SCI Primer that are associated with the algal species composition of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Analysis of the SCI Threshold

As discussed earlier, FDEP is using the SCI to determine whether a stream is exhibiting balanced fauna by measuring the health of the macroinvertebrate community within the stream. In Section 7.7 of FDEP's Freshwater TSD, the State explains that the many of the metrics that make up the SCI are sensitive to algal response.²⁷ Several of the metrics are expected to respond negatively to increased levels of algae, while other metrics would increase in response to algae. As noted on page 133 of the Freshwater TSD, "[a]ll of the above metric responses to algae would lower the SCI score." Therefore, it would be reasonable to expect that a waterbody with a "passing" SCI score would have scored well for these various metrics (and others that make up the SCI) and therefore is meeting its designated use.

Some commenters on Florida's rule objected to the use of the SCI in implementing the State's nutrient rule, arguing that the test is primarily a measure of biological response to human disturbance rather than a specific measure of nutrient pollution. An acceptable score on the SCI demonstrates that the fauna in a particular waterbody has not been compromised by environmental stress, either from nutrient pollution or any other type of environmental stress (e.g., human disturbance).²⁸

Paragraph 62-302.531(2)(c)(1) provides that, together with a showing that the floral metrics required by 62-302.531(2)(c) are attained, an "average [SCI] score of...40 or higher, with neither of the two most recent SCI scores less than 35" can be used to demonstrate that a stream is attaining the narrative nutrient criterion, even where the stream exceeds the numeric nutrient thresholds established in 62-302.531(2)(c)(2). The basis for this SCI threshold is described in FDEP's Freshwater TSD, specifically Section 3.4.1, which provides:

In 2007, DEP calibrated the SCI using primarily the Biological Condition Gradient approach resulting in 35 as the value at which the designated use of a healthy, well-balanced community is met, and exceptional threshold of 67....The examination of the average of the two most recent visits to 55 reference streams showed that the 2.5th percentile of reference data was an SCI score of 40 points, within a confidence interval that ranged from 35-44 points. Therefore, selection of an average SCI score of 40 as a threshold for aquatic life protection balances Type I and Type II errors.

The use of an SCI minimum score prevents a score less than 35, which represents an unhealthy community, from being averaged with a higher score to result in a "passing" average SCI score. This additional provision ensures that determinations of use support, based on an average SCI score of 40 or

²⁷ These include: number of sensitive taxa, number of Ephemeroptera taxa, number of Trichoptera taxa, percent filter-feeders, number of long-lived taxa, percent very tolerant, and percent dominant taxon. The last two would increase in response to toxic or non-toxic algae expressed in either the phytoplankton or periphyton, while the others would respond negatively to increases levels of algae, whether toxic or non-noxious varieties. The other metrics that make up an SCI score, number of total taxa, number of clinger taxa, percent Tanytarsini, were not specifically mentioned in section 7.7.

²⁸ See Florida Wildlife Federation et al v. Department of Environmental Protection, Fla. DOAH Case No. 11-6137, Final Order, June 7, 2012. Page 30.

greater, accurately represent the level of use support at a given site during all times of measurement.

The SCI Primer document discusses the use of the SCI in conjunction with other biological endpoints and water chemistry information. Section 2.7.6 of the SCI Primer document summarizes:

Attainment of the SCI threshold is an indication that the faunal community of the stream is not being adversely affected by nutrients to the extent that there is no loss in designated use. However, failure of the SCI threshold also does not mean that the stressor causing the loss of designated use is nutrients. Evaluation of other factors, as indicated by the nutrient enrichment model in 2.7.1 (including nutrient concentrations and floral communities) is useful information that could indicate nutrients are a factor. While the stressor may not be known, a failed SCI score does indicate that fauna is not well-balanced.

The use of the water chemistry data, specifically the numeric TP and TN thresholds, in conjunction with the floral and fauna components of this provision (62-302.531(2)(c)), and how conclusions of use support are made weighing together these different lines of evidence, is demonstrated in the examples provided in section 2.7.8 of the SCI Primer. In all six stream examples, the water chemistry data indicated exceedances of the TP and TN thresholds, but only in the four examples where flora and/or fauna were imbalanced did the State conclude the nutrient narrative criterion was not being achieved. In the two other examples, one example had no indication of imbalanced flora or fauna (even though the TP and TN thresholds were exceeded), and therefore was meeting the narrative nutrient criterion.²⁹ The other example had an imbalance of fauna (i.e., average SCI score < 40), but FDEP determined the imbalance was not caused by nutrients during the stressor identification study, in which case the water would be included on either the study list (if the pollutant causing the impairment was not identified) or the verified list (if the pollutant causing the impairment was identified).³⁰

The use of the SCI and the threshold score of 40 was addressed in the EPA's December 2010 final rule, at pages 75774 and 75775:

In the January 2010 proposal, EPA used a reference condition approach to derive numeric criteria that relied on the identification of biologically healthy sites that were unimpaired by nitrogen or phosphorus. EPA identified these sites from FDEP's streams data set, selecting sites where Stream Condition Index (SCI) scores were 40 and higher. The SCI is a multi-metric index of benthic macroinvertebrate community composition and taxonomic data developed by FDEP to assess the biological health of streams[.] An SCI score > 40 has been determined to be indicative of biologically healthy conditions based on an expert workshop and analyses performed by both FDEP and EPA. Please refer to the EPA's January 2010 proposal and the final TSD

²⁹ Although a different scenario from the assumptions made in these examples, Section 7.8 of FDEP's Freshwater TSD also envisions that because "nutrient responses are dependent of many other factors in streams, it is possible that there are site specific situations where nutrient concentrations below the reference based thresholds may not provide for the needed protection..."

³⁰ Note that a water with imbalanced flora would be included on FDEP's Study List as biologically impaired, even where the imbalance is demonstrated to be caused by a stressor other than nutrients, unless the state demonstrates that the biological impairment is not caused by a pollutant. See EPA's February 19, 2008 IWR decision.

accompanying this final rule for more information on the SCI and the selection of the SCI value of 40 as an appropriate threshold to identify biologically healthy sites.

Therefore, as summarized in FDEP's analysis and previous statements within the preamble for the EPA's December 2010 final rule, the SCI scores are based on scientific workshops and analyses. The SCI is an important screening tool in the development of nutrient criteria concentrations and, used in combination with other information such as that contained in 62-302.531(2)(c), provides a quantitative measure regarding the faunal component needed to be protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the SCI component of 62-302.531(2)(c) are located on pages 42-43.

Analysis of the Total Nitrogen and Total Phosphorus Thresholds

The FDEP rule provides numeric thresholds for TN and TP for Florida streams that apply unless a positive showing of both floral and faunal biological health is made for any particular stream or unless alternative values are adopted by FDEP and approved by the EPA as site-specific criteria. Class III waters located in South Florida, which are not otherwise classified as lakes, wetlands, or those flowing waters excepted from the definition of "stream" in 62-302 are not subject to numeric threshold values in 62-302.531(2)(c) at this time. Rather, the narrative nutrient criterion continues to apply to those waters.³¹ The TN and TP thresholds, as annual averages, established in the FDEP rule are not to be exceeded more than once in any three consecutive years.

As stated on page 127 of FDEP's Freshwater TSD, FDEP concluded that "specific [dose-response] thresholds could not be established due to the inherent variability within and between streams and the compounding complexity from other factors." Therefore, FDEP relied upon the reference condition approach as described in more detail below to identify TN and TP concentrations that are protective of the designated uses in covered Florida streams. The reference condition approach, a long-standing peer-reviewed methodology published by the EPA, was designed to develop protective numeric nutrient criteria where reference conditions can be confidently defined.³² The reference condition approach, which has been well documented, peer reviewed, and developed in a number of different contexts,^{33,34,35,36,37,38} is used to derive numeric nutrient criteria that are protective of applicable

³¹ Rule 62-302.540, which established a TP criterion of 10 ppb within the Everglades Protection Area, was not revised by the state nutrient rule.

³² USEPA. 2000. *Nutrient Criteria Technical Guidance Manual: Rivers and Streams*. EPA-822-B-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.; USEPA-SAB. 2011. *Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters*. U.S. Environmental Protection Agency, Science Advisory Board, Washington, DC.

³³ USEPA. 2000a. *Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs*. EPA-822-B-00-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

³⁴ USEPA. 2000b. *Nutrient Criteria Technical Guidance Manual: Rivers and Streams*. EPA-822-B-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

³⁵ Stoddard, J. L., D. P. Larsen, C. P. Hawkins, R. K. Johnson, and R. H. Norris. 2006. Setting expectations for the ecological condition of streams: the concept of reference condition. *Ecological Applications* 16:1267 – 1276.

designated uses by identifying TN and TP concentrations occurring in least-disturbed, healthy streams that are supporting designated uses. Using that approach, FDEP established thresholds based on an upper percentile distribution of the benchmark distribution of streams, as described more fully below. FDEP concluded the 90th percentile was the percentile that it would use for TN and TP thresholds in its integrated multimetric criterion.

Page 128 of FDEP's Freshwater TSD summarizes (as quoted below) the reasons FDEP used the 90th percentile of the benchmark distribution (with the exception of the West Central nutrient watershed region, where it used the 75th percentile):

- It is consistent with EPA guidance;
- DEP conducted a rigorous verification to demonstrate that the benchmark sites were minimally disturbed;
- DEP confirmed that healthy, well balanced biological communities were maintained at nutrient levels above the 90th percentile (greatly minimizing Type II error, the mistake of classifying an impaired site as acceptable);
- ...
- Use of a 75th percentile would result in an excessive Type I error (25% of benchmark sites, and a large number of healthy sites would incorrectly be classified as impaired), and subsequent use of resources to "restore" such unimpacted sites would constitute unwise public policy, and would contradict State Law (Chapter 403, F.S.); and
- Although the 95th and 99th percentiles were considered, DEP determined that there was insufficient certainty in the inclusiveness of the 95th and 99th percentiles given the sparseness of data at the extreme end of the distribution. However, DEP has high assurance that the 90th percentile is inclusive of the distribution of minimally disturbed sites due to the sufficiency of the data surrounding this range in all nutrient regions except for the West Central. In the West Central the 75th percentile was used due to the limited amount of data available.

However, according to FDEP, the "lack of a demonstration that biological impairment actually occurs at specific nutrient levels greater than the 90th percentile of the benchmark sites is a disadvantage of using this approach [and for this reason] DEP plans to conduct additional evaluation at sites with nutrient values higher than the 90th percentile to definitively establish that nutrients are a reasonable cause of designated use impairment." Freshwater TSD at page 127.

The EPA's review of FDEP's intent to use a multiple component process "to verify that biological impairment is occurring and, if so, to definitively establish that nutrients are a reasonable cause of

³⁶ Herlihy, A. T., S. G. Paulsen, J. Van Sickle, J. L. Stoddard, C. P. Hawkins, L. L. Yuan. 2008. Striving for consistency in a national assessment: the challenges of applying a reference-condition approach at a continental scale. *Journal of the North American Benthological Society* 27:860 – 877.

³⁷ U.S. EPA. 2001. Nutrient Criteria Technical Manual: Estuarine and Coastal Marine Waters. Office of Water, Washington, DC. EPA-822-B-01-003.

³⁸ USEPA-SAB. 2011. *Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters*. U.S. Environmental Protection Agency, Science Advisory Board, Washington, DC.

designated use impairment” is set out above. The remainder of this analysis will focus on FDEP’s derivation of the stream thresholds and the EPA’s review of those thresholds for consistency with regulatory and statutory requirements.

The State compiled data from numerous sources before screening the data to select a reference set of streams, which FDEP calls benchmark streams. FDEP then aggregated samples from the benchmark streams by waterbody identification number (WBID).³⁹ From this information, annual WBID geometric means for the reference set of streams were calculated, and then the resulting TN and TP 90th percentile values (or 75th percentile for the West Central) were calculated from those annual averages frequency distributions. As discussed on page 129 of FDEP’s Freshwater, the State concluded that the use of the “geometric mean, rather than an arithmetic mean, [provided] a more accurate representation of the central tendency of positively skewed data ... [and that the] annual geometric mean mutes the short-term variability in sampling quality data to provide a more reliable, long-term value for assessing the nutrient status in aquatic environments.” On page 193 of FDEP’s Freshwater TSD, FDEP articulates the basis of the annual average duration and once in a three year period frequency of excursions as “rooted precisely in how the criteria were calculated” and “based on EPA’s Technical Support Document for Water Quality-Based Toxics Control [which] when applied to non-toxic substances, such as nutrients, is inherently protective.”

Based on the effectiveness of the data quality screens in four of five NWRs, FDEP has concluded that the 90th percentile of annual average concentrations would be protective. In the remaining region, the West Central Region, because of fewer data screens to identify reference conditions in that NWR and subsequent lower confidence that these sites are least-disturbed conditions that support designated uses and natural populations of aquatic flora and fauna, FDEP has concluded the 75th percentile of annual average concentrations, rather than the 90th percentile, is the protective criterion-magnitude for the West Central region. Therefore, the magnitude values derived for the five NWRs are consistent with the requirements of 40 CFR part 131, including 131.11(b) and the CWA, and are approved by EPA pursuant to section 303(c) of the Act. The duration and frequency values associated with FDEP’s numeric stream criteria are the same as those associated with the numeric criteria in the EPA’s December 2010 final rule, which reflect the “latest scientific knowledge...on the kind and extent of all identifiable effects on health and welfare...which may be expected from the presence” of nutrients in Florida’s waters. Based on EPA’s review, the duration and frequency value adopted by the State provide the same level of protection as the EPA’s federally promulgated duration and frequency for nutrients in Florida, and therefore is consistent with the requirements of 40 CFR part 131, including 131.11(b) and the CWA, and are approved by the EPA pursuant to section 303(c) of the Act.

For the reasons outlined above, the EPA finds that the numeric thresholds for TN and TP, as well as the duration and frequency components are protective of the designated uses of covered Florida streams. The conclusions of the EPA’s review of the nutrient thresholds component of 62-302.531(2)(c) are located on pages 42-43.

EPA Conclusion Regarding Numeric Nutrient Criteria for Streams

As summarized on page 133 of FDEP’s Freshwater TSD, the State has established a structure in its

³⁹ More extensive details on the data sources, data processing, and criteria derivation can be found in Section 7.6 of FDEP’s Freshwater TSD.

nutrient rule that is designed “to ensure with confidence that nutrient concentrations provide for a well balanced natural population of flora and fauna, it is necessary to also measure and evaluate the actual flora and fauna of the stream.” The State adopted TN and TP thresholds along with a suite of numeric response variables (chlorophyll *a*, periphyton coverage (measured via RPS), nuisance macrophyte growth (measured via LVS), algal taxa dominance, and SCI) to measure flora and fauna. The floral nutrient response variables as a whole are biologically responsive, sensitive to nutrients, and cover major pathways that nutrient effects manifest for the state of Florida. In addition, the rule and its supporting documents make clear how the State interprets the desired condition of balanced floral and faunal populations. For example, if any one of the floral variables is not attained then the floral population is not in balance and the stream is placed on the State’s list of impaired waters. Furthermore, if either one of the nutrient thresholds is not attained and the State does not have data to evaluate all the floral measures, or if both a TN/TP threshold and a nutrient response variable (measuring either flora or fauna) are exceeded, then the stream is placed on the State’s list of impaired waters.

The suite of parameters adopted by the State was reviewed by the EPA in its analysis of the integrated criteria in paragraph 62-302.531(2)(c). As summarized in the respective sections above, the EPA has determined that paragraph 62-302.531(2)(c) includes multiple metrics that are protective of the designated use in a given stream at a given place and time for streams.⁴⁰ Florida’s narrative nutrient criterion is based on preventing an imbalance of flora and fauna. The numeric components of the integrated criterion in 62-302.531(2)(c) interpret the narrative criterion in 62-302.530(47)(b) in a way that focuses on a use test designed to assess whether that imbalance has occurred, and where it has not occurred then the use is met with regard to this criterion. The rule also provides numeric TN and TP thresholds applicable to Florida streams in the absence of a positive showing that streams are biologically healthy both in terms of flora and fauna. Following the EPA’s analysis of the rule and SCI Primer, in conjunction with the subsequent clarification provided by the Nutrient Standards Implementation Document, the EPA has determined this multi-metric criterion has addressed the variability associated with biological responses in streams in a reasonable manner and is one scientifically defensible way to achieve protection of the designated uses in covered Florida streams. For the reasons outlined above, the EPA finds that all components of the integrated, multimetric criterion in 62-302.531(2)(c), including the components identified above from the SCI Primer that are part of the new or revised water quality criterion, are consistent with CWA section 303(c) and 40 CFR Part 131 and are approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.531(3)

Except for data used to establish historical chlorophyll *a* levels, chlorophyll *a* data assessed under this Chapter shall be measured according to the DEP document titled “Applicability of Chlorophyll *a* Methods” (DEP-SAS-002/10), dated October 24, 2011, which is incorporated by

⁴⁰ EPA specifies “at that place and time” because, for example, the nutrient concentrations at the place and time of the bioassessment cannot provide assurance that nutrients at that level will not cause a problem at either a later time or further downstream of that point. EPA expects FDEP will rely on other WQS provisions to address considerations of downstream protection. EPA also notes that the document, *Development of Type III Site Specific Alternative Criteria for Nutrients* also addresses the State’s recommendations for development for a study design for development of Type III SSAC, which provides factors that should be considered in conducting nutrient studies to ensure data quality and sufficiency in assessing ambient water quality conditions.

reference herein. Copies of the chlorophyll *a* document may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. Chlorophyll *a* data collected after [effective date] shall be corrected for or free from the interference of phaeophytin.

Subsection 62-302.531(3) identifies the analytical methodology to be used for measurement of chlorophyll *a* concentrations assessed under Florida's nutrient rule and includes a reference to that methodology. This reference is not a new or revised WQS, as it does not establish or revise the magnitude, duration, or frequency of the chlorophyll *a* criteria established by the State. However, the last sentence in Subsection 62-302.531(3) specifies that chlorophyll *a* measurements made after the effective date of these WQS revisions must be corrected for, or free from, the interference of phaeophytin. Because this provision reflects a change in the compounds that are used to judge compliance with chlorophyll *a* criteria, the last sentence is a WQS revision that is subject to the EPA review under CWA section 303(c).

Using chlorophyll *a* data that is corrected for or free from the interference of phaeophytin is the same approach that the EPA used in developing federal nutrient criteria. Therefore, Florida's approach relies on the science underlying the EPA's criteria, and is consistent with the Agency's review of the latest scientific knowledge available regarding the effects of nutrients on waters in Florida.⁴¹ Phaeophytin is a degradation product of algal cell chlorophyll, and is not an appropriate measure of algal biomass or primary productivity. This sentence ensures that measurements of chlorophyll *a* are accurate and assess the same chlorophyll *a* levels that the EPA used in the promulgation of nutrient criteria for the State.

Therefore, the EPA finds that this provision is consistent with CWA section 303(c) and 40 CFR Part 131 and is approved by the EPA pursuant to section 303(c) of the Act.

Protection of Downstream Waters

Subsection 62-302.531(4)

(4) The loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters.

The EPA's regulation at 40 CFR section 131.10(b), provides:

In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.

Subsection 62-302.531(4) provides that "[t]he loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters." In addition to subsection 62-302.531(4), the State, in adopting revisions to Chapters 62-302 and

⁴¹ See footnote b to Table 1 in 40 CFR section 131.43(c).

62-303, further addressed the protection of downstream waters/downstream WQS in several new provisions of Florida WQS, including new/revised provisions at 62-302.800(3), 62-302.800(3)(a)3., 62-303.390(2)(a), and 62-303.450(4). In addition to these provisions of Florida WQS, the provisions of 62-303.390(3) also reinforce how these downstream protection provisions will be incorporated into nutrient criteria for certain waters included on Florida's CWA section 303(d) list. Each of these provisions serves as a fundamental component of the State's approach for protection of downstream water quality. In order to address all of the components in a holistic way, this review of 62-302.531(4) also addresses the downstream protection provisions located in other parts of Florida WQS, including the discussion of these provisions in FDEP's Nutrient Standards Implementation Document, which clarifies how FDEP will implement these provisions.

The State, at page 29 of the *NNC and Protection of Downstream Waters* section of its Nutrient Standards Implementation Document, has explained the intended implementation of this provision as follows:

- Using models to allocate to upstream watersheds when establishing the TMDL for the downstream waterbody;
- Requiring dischargers, at the time of permit issuance, to provide reasonable assurance that their effluent does not cause or contribute to nutrient impairments in the receiving waterbody and downstream waterbodies; and
- Identifying trends in nutrient concentrations in all waters, including downstream waters, during the assessment cycle.

The State also explained in that section of the Nutrient Standards Implementation document that a watershed model can be used to determine the appropriate nutrient levels from upstream waters that are needed to ensure compliance with downstream WQS. The State described that modeling, or similar approaches are to be used to demonstrate downstream standards attainment on page 6 of the document, *Development of Type III Site Specific Alternative Criteria for Nutrients*, stating "if the downstream waters do not attain water quality standards related to nutrient conditions, a demonstration must be made that the nutrient levels established by the Type III SSAC, when delivered to downstream waters ... provide for the attainment and maintenance of water quality standards, using water quality models or other scientifically defensible methods." (See additional discussion of this document, which is referenced in 62-302.800(3), below.) This approach was used by the EPA in the December 2010 final rule.⁴² The State, on page 29 of the Nutrient Standards Implementation Document, also discusses other options for such a determination, stating:

For example, if a downstream lake is currently attaining its nutrient standards, then current conditions in the upstream waters provide for that attainment condition (*i.e.*, loading of nutrients from the waterbody would be limited at current conditions to provide for the continued attainment and maintenance of water quality standards in downstream waters). However, a Level

⁴² 40 CFR section 141.43(c)(2)(ii)(B) allows the use of a "scientifically defensible technical model other than BATHTUB upon demonstration that use of another scientifically defensible technical model would protect the lake's designated uses and meet all applicable criteria for the lake. The State or EPA may designate the wasteload and/or load allocations from a TMDL established or approved by EPA as DPV(s) if the allocations from the TMDL will protect the lake's designated uses and meet all applicable criteria for the lake." 40 CFR 131.43(e) allows the development of site-specific alternative criteria in lieu of the federal criteria established by EPA. EPA has developed guidance for such SSAC which includes, among other requirements, that the SSAC are shown to be protective of downstream WQS.

II WQBEL⁴³ will be needed to evaluate the impacts on downstream waters if the facility requests an increase in their permitted load.

If a downstream waterbody is not attaining nutrient standards, the permit could not be issued until reasonable assurance was provided that the facility's discharge was not contributing to the impairment. This can be done in response to a Department adopted TMDL, or through independent modeling conducted in the watershed. Once modeling is conducted, the results of that modeling can be used to ensure that loading of nutrients from the upstream waterbody is limited as necessary to provide for the attainment and maintenance of the water quality standards of downstream waters.

The language in the Nutrient Standards Implementation Document clarifies that numeric values will be used to determine downstream protection. In the case of a water body that is attaining its nutrient standards, compliance with downstream standards will be evaluated using a direct comparison of ambient conditions with the downstream water's numeric criteria values. Also, as discussed below, the Nutrient Standards Implementation Document explains on page 30 how the trend analysis required in 62-303 operates to ensure downstream protection. In the case of a downstream water body that is not attaining its criteria, modeling will be conducted to determine a numeric WQBEL or TMDL to quantify the contributions of upstream nutrients that will meet the numeric downstream criteria values.

As explained above, other provisions of Florida WQS and the Nutrient Standards Implementation Document provide the details of the processes of Florida's quantitative approach for ensuring the attainment and maintenance of downstream WQS. These provisions, and how they relate to implementation of subsection 62-302.531(4), are discussed immediately below.

Section 62-302.800 Site Specific Alternative Criteria.

The Rule includes a new provision providing for the adoption of Type III Site Specific Alternative Criteria (SSAC) for nutrients (Type III SSAC). Prior to adoption of the rule, Florida WQS provided for two other categories of SSAC in 62-302.800: Type I SSAC, which allow for SSAC when a criterion cannot be met due to natural background conditions or due to man-induced conditions which cannot be controlled or abated; and Type II SSAC, which allow for SSAC to be established on the basis of site-specific reasons other than for a Type I SSAC.

The option of Type III SSAC was included as part of the Florida rule to enable adoption of criteria for specific water bodies where a nutrient criterion based on site specific conditions should replace the otherwise applicable numeric criteria established in 62-302.531, and to establish regulatory requirements for the technical and scientific justifications necessary to ensure that Type III SSAC are protective of the designated uses of the waters to which they apply. A petition for a Type III SSAC for a water body must include a demonstration that the proposed SSAC "achieve the narrative nutrient criteria in paragraph 62-303.530(47)(b), F.A.C., and are protective of downstream waters."

⁴³ 62-650.500(2) provides, "The WQBEL Level II Process is utilized to determine new discharge permit limits and to evaluate permit renewals when existing water quality data is insufficient to evaluate expected water quality impacts or when the available assimilative capacity of the water body is being completely utilized, or might reasonably be expected to be completely utilized by the discharge, either by itself, or in combination with other discharges to the receiving water body.

Section 62-302.800(3) addresses the requirements for development of Type III SSAC, including the requirement of a demonstration “that the proposed criteria ... are protective of downstream waters.” The details of this requirement are set out in 62-302.800(3)(a)3, which provides two options for demonstrating that a Type III SSAC protects the WQS of downstream waters. The first option is based on a demonstration that downstream waters are attaining water quality standards related to nutrient conditions pursuant to Chapter 62-303, F.A.C. The second option addresses cases where the downstream waters do not attain water quality standards related to nutrient conditions.

Where the downstream waterbody is attaining WQS, a Type III SSAC may be established for an upstream waterbody if downstream waters are attaining WQS for nutrients during water quality conditions in the upstream water body that are representative of the SSAC. 62-302.800(3)(a)3 refers to Chapter 62-303 to determine whether the downstream waterbody is attaining WQS for nutrients. Chapter 62-303 includes provisions at 62-303.390(2)(a) and 62-303.450(4) for assessing attainment based on the degree of change in nutrient parameters. This method is also known as the “trend analysis.” Particularly as applied to downstream waters such as lakes and estuaries, EPA understands that the trend analysis provides a mechanism to assess the continued attainment of nutrient WQS that will be considered in the development of Type III SSAC, and that will also provide a future check on SSAC that have been adopted for upstream waters. Should the downstream water develop an increasing trend that is predicted to result in exceedance of the numeric nutrient thresholds as established in 62-303.390(2)(a) and 62-303.450(4), the downstream water will be identified on the State’s section 303(d), based on 62-303.390(2)(a) or 62-303.450(4). The upstream waters flowing into that downstream water will be identified on the State’s CWA section 303(d) list based on subsection 62-302.531(4).

Where the downstream waters are impaired for nutrients, Type III SSAC may be established where the nutrients delivered pursuant to the SSAC either (a) meet the allocations of a downstream TMDL, or (b) provide for the attainment and maintenance of water quality standards in downstream waters. The EPA understands that the required “attainment and maintenance” demonstration would be made for cases where the State has not yet developed a TMDL for the downstream WQS impairment.

The provisions discussed above are set out in 62-302.800(3), which establishes the Type III nutrient SSAC. However, the requirement that SSAC protect downstream waters also applies to Type II nutrient SSAC. On page 34 of the NNC Implementation Document, FDEP states that the “requirement to ensure protection of downstream waters is explicitly described in the rule for Type III SSACs, but it is also required for Type II SSACs for nutrients”.

As discussed above, the provisions of 62-302.800 clearly require that the effect of nutrient loads from upstream waters on downstream waters be considered when establishing a nutrient SSAC. The State will utilize the numeric thresholds or criteria for waters that are attaining standards (in conjunction with the trend analysis, which is discussed below), will use numeric values for upstream sources that are necessary to comply with the allocations of a TMDL, or will develop numeric values based on demonstrating the nutrient load an impaired downstream water can receive from upstream waters and still attain downstream WQS. This quantitative approach results in nutrient SSAC incorporating numeric-based requirements for protection of downstream waters.

62-303.390 and 62-303.450 Assessment of Increasing Trends in Nutrient Concentrations

62-303.390(2)(a) and 62-303.450(4) establish WQS provisions that provide an objective, quantitative process to assess trends in ambient data for nutrient parameters. These provisions apply to all Class I, II, and III waters. While use of the trend analysis is not limited to situations where a waterbody is either upstream or downstream of another waterbody, the State's Nutrient Standards Implementation Document at page 30 describes the application of this provision as follows:

Even if both upstream and downstream waters are currently attaining nutrient standards or in situations where information for downstream waters is not available, the Department's nutrient standards include an evaluation of trends to ensure that conditions are not increased in a manner that could result in impairment downstream.

FDEP's rule at 62-303.390(2)(a) requires that a water body that is otherwise attaining its nutrient criteria be included on the Study List portion of Florida's CWA section 303(d) list if data for TN, TP, nitrate-nitrite, or chlorophyll a show a statistically-significant increasing trend and there is a reasonable expectation that the water will become impaired within 10 years, "taking into consideration the current concentrations of nutrients or nutrient response variables and the slope of the trend." FDEP's rule at 62-303.450 requires that a water body that is otherwise attaining its nutrient criteria be included on the Verified List portion of Florida's CWA section 303(d) list if data for nutrient response variables show a statistically-significant increasing trend and there is a reasonable expectation that the water will become impaired within 5 years.

The rule provides that some data can be excluded from the analysis to remove the effects of confounding variables, "such as climatic and hydrologic cycles, seasonality, quality assurance issues, and changes in analytical methods or method detection limits." The EPA agrees that it is reasonable to exclude data from such analyses under certain limited circumstances. The State's choice of data exclusions are reasonable in that they address water quality variations that may not directly relate to an analysis of whether nutrient contributions in a watershed are increasing over a period of multiple years. Also, the EPA notes that the increasing trend analyses conducted by the State are subject to the EPA's review of State CWA Section 303(d) listing decisions, including the State's decisions regarding specific ambient data that should be considered in the State's assessment process.

62-303.390(2)(a) and 62-303.450(4) refer to the provisions of 62-303.351(5), 62-303.352(3), 62-303.353(4) and 62-303.354(3), which require that the statistical evaluation of data for an increasing trend analysis be conducted using a Mann's one-sided upper-tail test. The Mann's test for trend is a nonparametric test, which is supported by a number of readily available statistical programs including Microsoft Excel and S-Plus. The EPA has reviewed this method and determined that this test is widely accepted as an appropriate tool for statistical evaluation to determine whether the individual points in a data set exhibit a significant trend and does not require a minimum sample size. The Mann's test for trend and the associated Kendall's rank correlation coefficient are considered to be reliable nonparametric trend tests due to their high power, regardless of the underlying distribution. (Helsel and Hirsch, *Statistical Methods in Water Resources*, 2002 USGS and Yue, *A comparison of the power of the t test, Mann-Kendall and bootstrap tests for trend detection*, Hydrological Sciences, 49(1) Feb. 2004.)

As discussed on page 30 of the Nutrient Standards Implementation Document, the State selected a confidence level of 95 percent for application of the test, which will identify trends that are clearly

statistically significant. The sections of 62-303.351(5), 62-303.352(3), 62-303.353(4), and 62-303.354(3) that use this test refer to the use of data for chlorophyll a, TN and TP “over the planning period.” As discussed more fully on pages 83 and 103 below related to the EPA’s complete review of 62-303.390(2)(e), the EPA considers this restriction of data to the “planning period” to be related to data reliability, and, therefore, the State’s references to the “planning period” in 62-303.351(5), 62-303.352(3), 62-303.353(4), and 62-303.354(3), as those terms are implemented in 62-303.390(2)(a) and 62-303.450(4), are not considered by the EPA to be a WQS for the purposes of the EPA’s review of these provisions.

The EPA considers the statistical utility of the Mann’s one-sided upper-tail test to be a scientifically defensible approach to assess possible trends of data for nutrient parameters, and the use of the test in these circumstances, as referenced in 62-303.390(2)(a) and 62-303.450(4), is approved by the EPA pursuant to CWA section 303(c).

In discussing how the trend analysis described above is one component of the State’s approach to downstream protection, FDEP included an example of how the increasing trend analysis would have been applied to the Weeki Wachee River on pages 31 and 32 of the Nutrient Standards Implementation Document:

Any TMDL developed to address the increasing trend in nitrate levels would, in addition to protecting the Weeki Wachee River, have the added benefit of protecting downstream waters even if there were no observable increases in nutrients or nutrient response variable in the downstream waters. Because the trend test applies to lakes and estuaries, as well as the streams that feed them, it provides an enhanced method to assure that downstream waters are fully protected. In addition to the above example, if an adverse trend in TP were observed in a downstream lake or estuary, a site specific criterion would be developed for the waterbody prior to it becoming impaired, and this action would establish TP expectations for upstream waters at a level that would prevent the lake or estuary from exceeding the applicable nutrient criteria. The adverse trend test, which is linked to the numeric criteria necessary to protect recreation and healthy, well balanced aquatic communities, allows for Hierarchy 1 site-specific and highly accurate downstream protection values to be developed prior to the downstream waters from becoming impaired.

The EPA’s September 16, 2009 letter to FDEP stated that there were “indications that the numeric values Florida is moving forward with ... may not provide for the attainment and maintenance of downstream water quality standards.” These concerns were based on the EPA’s comparison of the State’s proposed criteria to TMDL requirements, modeling and statistical analysis of downstream data and the levels of nutrients that appeared to be needed to protect downstream waters. Since then, the State has added, among other things, the provisions in 62-303.390(2)(a) and 62-303.450(4) related to the trend analysis. For cases where the downstream water body attains applicable nutrient criteria, a significant upward trend in ambient nutrient levels that is predicted to result in use impairment in either 10 years (Study List) or 5 years (Verified List) will result in listing of the applicable water body(ies) based on the “trend analysis” provision. If the downstream water body is not attaining applicable nutrient criteria, the State will continue its practice of listing the downstream water body as not attaining its designated use and its numeric nutrient criteria will be used to determine appropriate nutrient reductions/controls for all sources in the watershed.

The State's new numeric nutrient criteria in place for lakes and some estuaries makes implementation of the "trend analysis" more streamlined and less time-consuming and resource intensive. Any increasing trend would be considered in relation to the newly established criteria for the downstream water. The increasing trend WQS provision protects the downstream waters covered in this rule directly, establishes a scientifically defensible mechanism to identify waters that may become impaired in the future, and allows sufficient time for developing source control requirements to prevent impairments of downstream waters.

On page 30 of the Nutrient Standards Implementation Document, the State addressed the process for returning waters to attainment in cases where the increasing trend WQS provision is not met, that is, where a waterbody is projected to become impaired within ten or five years, whichever is applicable. For waters included on the Study List based on a trend analysis, FDEP will develop a site specific numeric interpretation of the narrative nutrient criterion for the waterbody. This interpretation would likely be a nutrient SSAC, and would be implemented and applied to upstream waters feeding the downstream waterbody. For waters on the Verified List, FDEP will develop a TMDL, which will also be a site specific numeric interpretation of the narrative nutrient criterion for the waterbody. See subsection 62-303.390(3). The TMDL would include wasteload allocations for point sources and load allocations for nonpoint sources, would be implemented in NPDES permits for upstream dischargers, and any needed reductions in nonpoint sources would be implemented via the BMAP for the TMDL, which is enforceable for nonpoint sources.

For the reasons above, the EPA finds that the trend analysis is a scientifically defensible quantitative approach for protecting waters that currently meet applicable nutrient WQS.

EPA's Conclusion Regarding Protection of Downstream Waters

Based on the EPA's review, the new and revised downstream WQS provisions adopted by the State provide for quantitative processes that will serve to ensure the attainment and maintenance of downstream waters by requiring nutrient control measures not only in cases where nutrient impairment has already been documented, but also in cases where nutrient standards are currently met in downstream waters, but maintaining compliance with those nutrient standards is threatened as documented by water quality trends. In addition to its general provision that the loading of nutrients be limited to protect downstream waters, the State has also included downstream protections in provisions related to establishing nutrient SSAC and waterbody assessment. The combination of these provisions will enable effective and expeditious consideration of downstream standards when developing numeric nutrient criteria. The provisions will also allow the State to address existing impairments due to nutrients, as well as a proactive component to address projections of impairments in the future.

The Agency also notes that subparagraph (9)(c) of Rule 62-302.400, *Classification of Surface Waters, Usage, Reclassification, Classified Waters*, requires the following affirmative finding prior to the reclassification of a water body: "The proposed reclassification will not allow for the nonattainment of water quality standards in downstream waters." This provision is an existing provision, previously adopted by FDEP, and approved by the EPA, and was not revised during the State's nutrient criteria rulemaking. It is identified in this review because it provides additional regulatory authority to ensure that downstream water protections are achieved in any regulatory revision that changes the designated use for any water body in the State.